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The Independent JPEG Group's JPEG software

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### README for release 6b of 27-Mar-1998

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This software is the work of Tom Lane, Philip Gladstone, Jim Boucher, Lee Crocker, Julian Minguillon, Luis Ortiz, George Phillips, Davide Rossi, Guido Vollbeding, Ge' Weijers, and other members of the Independent JPEG Group.

IJG is not affiliated with the official ISO JPEG standards committee.

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This file contains the following sections:

OVERVIEW	General description of JPEG and the IJG software.
LEGAL ISSUES	Copyright, lack of warranty, terms of distribution.
REFERENCES	Where to learn more about JPEG.
ARCHIVE LOC	ATIONS Where to find newer versions of this software.
RELATED SOFTWARE Other stuff you should get.	
FILE FORMAT WARS Software *not* to get.	
TO DO	Plans for future IJG releases.

Other documentation files in the distribution are:

User documentation:

How to configure and install the IJG software.	
Usage instructions for cjpeg, djpeg, jpegtran,	
rdjpgcom, and wrjpgcom.	
Unix-style man pages for programs (same info as usage.doc).	
Advanced usage instructions for JPEG wizards only.	
Version-to-version change highlights.	
Programmer and internal	
documentation:	
How to use the JPEG library in your own programs.	
Sample code for calling the JPEG library.	
• Overview of the JPEG library's internal structure.	
Road map of IJG files.	
Coding style rules please read if you contribute code.	

Please read at least the files install.doc and usage.doc. Useful information can also be found in the JPEG FAQ (Frequently Asked Questions) article. See ARCHIVE LOCATIONS below to find out where to obtain the FAQ article.

If you want to understand how the JPEG code works, we suggest reading one or more of the REFERENCES, then looking at the documentation files (in roughly the order listed) before diving into the code.

#### **OVERVIEW**

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This package contains C software to implement JPEG image compression and decompression. JPEG (pronounced "jay-peg") is a standardized compression method for full-color and gray-scale images.

JPEG is intended for compressing

"real-world" scenes; line drawings, cartoons and other non-realistic images

are not its strong suit. JPEG is lossy, meaning that the output image is not exactly identical to the input image. Hence you must not use JPEG if you have to have identical output bits. However, on typical photographic images, very good compression levels can be obtained with no visible change, and remarkably high compression levels are possible if you can tolerate a low-quality image. For more details, see the references, or just experiment with various compression settings.

This software implements JPEG baseline, extended-sequential, and progressive compression processes. Provision is made for supporting all variants of these processes, although some uncommon parameter settings aren't implemented yet. For legal reasons, we are not distributing code for the arithmetic-coding variants of JPEG; see LEGAL ISSUES. We have made no provision for supporting the

hierarchical or lossless processes defined in the standard.

We provide a set of library routines for reading and writing JPEG image files, plus two sample applications "cjpeg" and "djpeg", which use the library to perform conversion between JPEG and some other popular image file formats. The library is intended to be reused in other applications.

In order to support file conversion and viewing software, we have included considerable functionality beyond the bare JPEG coding/decoding capability; for example, the color quantization modules are not strictly part of JPEG decoding, but they are essential for output to colormapped file formats or colormapped displays. These extra functions can be compiled out of the library if not required for a particular application. We have also included "jpegtran", a utility for lossless transcoding between different JPEG processes, and "rdjpgcom" and "wrjpgcom", two simple applications for inserting and extracting textual comments in JFIF files.

The emphasis in designing this software has been on achieving portability and flexibility, while also making it fast enough to be useful. In particular, the software is not intended to be read as a tutorial on JPEG. (See the REFERENCES section for introductory material.) Rather, it is intended to be reliable, portable, industrial-strength code. We do not claim to have achieved that goal in every aspect of the software, but we strive for it.

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The Unix configuration script "configure" was produced with GNU Autoconf. It is copyright by the Free Software Foundation but is freely distributable. The same holds for its supporting scripts (config.guess, config.sub, ltconfig, ltmain.sh). Another support script, install-sh, is copyright by M.I.T. but is also freely distributable.

It appears that the arithmetic coding option of the JPEG spec is covered by patents owned by IBM, AT&T, and Mitsubishi. Hence arithmetic coding cannot

legally be used without obtaining one or more licenses. For this reason, support for arithmetic coding has been removed from the free JPEG software. (Since arithmetic coding provides only a marginal gain over the unpatented Huffman mode, it is unlikely that very many implementations will support it.) So far as we are aware, there are no patent restrictions on the remaining code.

The IJG distribution formerly included code to read and write GIF files. To avoid entanglement with the Unisys LZW patent, GIF reading support has been removed altogether, and the GIF writer has been simplified to produce "uncompressed GIFs". This technique does not use the LZW algorithm; the resulting GIF files are larger than usual, but are readable by all standard GIF decoders.

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#### REFERENCES

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#### We

highly recommend reading one or more of these references before trying to understand the innards of the JPEG software.

The best short technical introduction to the JPEG compression algorithm is Wallace, Gregory K. "The JPEG Still Picture Compression Standard",

Communications of the ACM, April 1991 (vol. 34 no. 4), pp. 30-44. (Adjacent articles in that issue discuss MPEG motion picture compression, applications of JPEG, and related topics.) If you don't have the CACM issue handy, a PostScript file containing a revised version of Wallace's article is available at ftp://ftp.uu.net/graphics/jpeg/wallace.ps.gz. The file (actually a preprint for an article that appeared in IEEE Trans. Consumer Electronics) omits the sample images that appeared in CACM, but it includes corrections and some added material. Note: the Wallace article is copyright ACM and IEEE, and it may not be used for commercial purposes.

#### A somewhat less technical, more

leisurely introduction to JPEG can be found in

"The Data Compression Book" by Mark Nelson and Jean-loup Gailly, published by M&T Books (New York), 2nd ed. 1996, ISBN 1-55851-434-1. This book provides good explanations and example C code for a multitude of compression methods including JPEG. It is an excellent source if you are comfortable reading C code but don't know much about data compression in general. The book's JPEG sample code is far from industrial-strength, but when you are ready to look at a full implementation, you've got one here...

The best full description of JPEG is the textbook "JPEG Still Image Data Compression Standard" by William B. Pennebaker and Joan L. Mitchell, published by Van Nostrand Reinhold, 1993, ISBN 0-442-01272-1. Price US\$59.95, 638 pp. The book includes the complete text of the ISO JPEG standards (DIS 10918-1 and draft DIS 10918-2). This is by far the most complete exposition of JPEG in existence, and we highly recommend it.

#### The

JPEG standard itself is not available electronically; you must order a paper copy through ISO or ITU. (Unless you feel a need to own a certified official copy, we recommend buying the Pennebaker and Mitchell book instead; it's much cheaper and includes a great deal of useful explanatory material.) In the USA, copies of the standard may be ordered from ANSI Sales at (212) 642-4900, or from Global Engineering Documents at (800) 854-7179. (ANSI doesn't take credit card orders, but Global does.) It's not cheap: as of 1992, ANSI was charging \$95 for Part 1 and \$47 for Part 2, plus 7% shipping/handling. The standard is divided into two parts, Part 1 being the actual specification, while Part 2 covers compliance testing methods. Part 1 is titled "Digital Compression and Coding of Continuous-tone Still Images, Part 1: Requirements and guidelines" and has document numbers ISO/IEC IS 10918-1, ITU-T T.81. Part 2 is titled "Digital Compression and Coding of Continuous-tone Still

Images, Part 2: Compliance testing" and has document numbers ISO/IEC IS 10918-2, ITU-T T.83.

Some extensions to the original JPEG standard are defined in JPEG Part 3, a newer ISO standard numbered ISO/IEC IS 10918-3 and ITU-T T.84. IJG currently does not support any Part 3 extensions.

The JPEG standard does not specify all details of an interchangeable file format. For the omitted details we follow the "JFIF" conventions, revision 1.02. A copy of the JFIF spec is available from: Literature Department C-Cube Microsystems, Inc. 1778 McCarthy Blvd. Milpitas, CA 95035 phone (408) 944-6300, fax (408) 944-6314 A PostScript version of this document is available by FTP at ftp://ftp.uu.net/graphics/jpeg/jfif.ps.gz. There is also a plain text version at ftp://ftp.uu.net/graphics/jpeg/jfif.txt.gz, but it is missing the figures.

The TIFF 6.0 file format specification can be obtained by FTP from ftp://ftp.sgi.com/graphics/tiff/TIFF6.ps.gz. The JPEG incorporation scheme

found in the TIFF 6.0 spec of 3-June-92 has a number of serious problems. IJG does not recommend use of the TIFF 6.0 design (TIFF Compression tag 6). Instead, we recommend the JPEG design proposed by TIFF Technical Note #2 (Compression tag 7). Copies of this Note can be obtained from ftp.sgi.com or from ftp://ftp.uu.net/graphics/jpeg/. It is expected that the next revision of the TIFF spec will replace the 6.0 JPEG design with the Note's design. Although IJG's own code does not support TIFF/JPEG, the free libtiff library uses our library to implement TIFF/JPEG per the Note. libtiff is available from ftp://ftp.sgi.com/graphics/tiff/.

#### ARCHIVE LOCATIONS

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The "official" archive site for this software is ftp.uu.net (Internet address 192.48.96.9). The most recent released version can always be found there in directory graphics/jpeg. This particular version will be archived as ftp://ftp.uu.net/graphics/jpeg/jpegsrc.v6b.tar.gz. If you don't have

direct Internet access, UUNET's archives are also available via UUCP; contact help@uunet.uu.net for information on retrieving files that way.

Numerous Internet sites maintain copies of the UUNET files. However, only ftp.uu.net is guaranteed to have the latest official version.

You can also obtain this software in DOS-compatible "zip" archive format from the SimTel archives (ftp://ftp.simtel.net/pub/simtelnet/msdos/graphics/), or on CompuServe in the Graphics Support forum (GO CIS:GRAPHSUP), library 12 "JPEG Tools". Again, these versions may sometimes lag behind the ftp.uu.net release.

The JPEG FAQ (Frequently Asked Questions) article is a useful source of general information about JPEG. It is updated constantly and therefore is not included in this distribution. The FAQ is posted every two weeks to Usenet newsgroups comp.graphics.misc, news.answers, and other groups. It is available on the World Wide Web at http://www.faqs.org/faqs/jpeg-faq/ and other news.answers

archive sites, including the official news.answers

archive at rtfm.mit.edu: ftp://rtfm.mit.edu/pub/usenet/news.answers/jpeg-faq/. If you don't have Web or FTP access, send e-mail to mail-server@rtfm.mit.edu with body send usenet/news.answers/jpeg-faq/part1

send usenet/news.answers/jpeg-faq/part2

#### RELATED SOFTWARE

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Numerous viewing and image manipulation programs now support JPEG. (Quite a few of them use this library to do so.) The JPEG FAQ described above lists some of the more popular free and shareware viewers, and tells where to obtain them on Internet.

If you are on a Unix machine, we highly recommend Jef Poskanzer's free PBMPLUS software, which provides many useful operations on PPM-format image files. In particular, it can convert PPM images to and from a wide range of other formats, thus making cjpeg/djpeg considerably more useful. The latest version is distributed by the NetPBM group, and is available from numerous sites,

notably ftp://wuarchive.wustl.edu/graphics/graphics/packages/NetPBM/. Unfortunately PBMPLUS/NETPBM is not nearly as portable as the IJG software is; you are likely to have difficulty making it work on any non-Unix machine.

A different free JPEG implementation, written by the PVRG group at Stanford, is available from ftp://havefun.stanford.edu/pub/jpeg/. This program is designed for research and experimentation rather than production use; it is slower, harder to use, and less portable than the IJG code, but it is easier to read and modify. Also, the PVRG code supports lossless JPEG, which we do not. (On the other hand, it doesn't do progressive JPEG.)

#### FILE FORMAT WARS

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Some JPEG programs produce files that are not compatible with our library. The root of the problem is that the ISO JPEG committee failed to specify a concrete file format. Some vendors "filled in the blanks" on their own, creating proprietary formats that no one else could read. (For example, none of the early commercial JPEG implementations for the Macintosh were able to exchange compressed files.)

The file format we have adopted is called JFIF (see REFERENCES). This format has been agreed to by a number of major commercial JPEG vendors, and it has become the de facto standard. JFIF is a minimal or "low end" representation. We recommend the use of TIFF/JPEG (TIFF revision 6.0 as modified by TIFF Technical Note #2) for "high end" applications that need to record a lot of additional data about an image. TIFF/JPEG is fairly new and not yet widely supported, unfortunately.

The upcoming JPEG Part 3 standard defines a file format called SPIFF. SPIFF is interoperable with JFIF, in the sense that most JFIF decoders should be able to read the most common variant of SPIFF. SPIFF has some technical advantages over JFIF, but its major claim to fame is simply that it is an official standard rather than an informal one. At this point it is unclear whether

SPIFF will supersede JFIF or whether JFIF will remain the de-facto standard. IJG intends to support SPIFF once the standard is frozen, but we have not decided whether it should become our default output format or not. (In any case, our decoder will remain capable of reading JFIF indefinitely.)

Various proprietary file formats incorporating JPEG compression also exist. We have little or no sympathy for the existence of these formats. Indeed, one of the original reasons for developing this free software was to help force convergence on common, open format standards for JPEG files. Don't use a proprietary file format!

#### TO DO

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The major thrust for v7 will probably be improvement of visual quality. The current method for scaling the quantization tables is known not to be very good at low Q values. We also intend to investigate block boundary smoothing, "poor man's variable quantization", and other means of improving quality-vs-file-size performance without sacrificing compatibility.

In future versions, we are considering supporting some of the upcoming JPEG Part 3 extensions --- principally, variable quantization and the SPIFF file format.

As always, speeding things up is of great interest.

Please send bug reports, offers of help, etc. to jpeg-info@uunet.uu.net.

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# 1.2.1 Available under license :

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# 1.4 xerces-j 2.12.2

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## 1.10 visual-studio-runtime 8.00.50727.9554

//===//

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## Core Docs

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\* ucrtbase.dll (used by .NET runtime)

\* D3DCompiler\_47\_cor3.dll (used by WPF)

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\* Microsoft.DiaSymReader.Native.{x86|amd64|arm|arm64}.dll (used by .NET SDK)

All other binaries and files are licensed with the [MIT license](https://github.com/dotnet/core/blob/main/LICENSE.TXT)

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We're still working out the best way to present contributors and trying to be as accurate as possible. The list below is generated with the following command listed below in an attempt to capture all contributions which have gone into .NET Core SDK 1.0. Where multiple email addresses were returned for a single person, the counts were aggregated with the email address reported the most commits.

```bash

git shortlog -sne --no-merges --until release/1.1.0@{2017-02-25}

When you navigate to a contributors commit page, the results are not filtered by release so more commits than are listed below will be shown.

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# Contributions to .NET Core 2.0

The list below is generated with the following command listed below in an attempt to capture all contributions which have gone into .NET Core 2.0.

#### ```bash

git shortlog -sne --no-merges --since release/2.0.0@{2016-10-03} --until release/2.0.0@{2017-07-25}

When you navigate to a contributors commit page, the results are not filtered by release so more commits than are listed below will be shown.

### \* [CLI](#cli)

\* [CoreCLR](#coreclr)

\* [CoreFX](#corefx)

\* [WCF](#wcf)

## ## CLI

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# Contributions to .NET 5.0

.NET 5 is an amazing milestone enabled, in part, by a wonderfully engaged community. This page is an attempt to acknowledge the efforts of many folks across the breadth of the ecosystem. We're working to get better at recognizing the your contributions so please, let us know if something is incorrect or missing.

\*\*Thank you!!\*\*

</br>[aspnetcore](#aspnetcore)

</br>[efcore](#efcore) </br>[installer](#installer) </br>[runtime](#runtime) </br>[sdk](#sdk) </br>[templating](#templating) </br>[wcf](#wcf) </br>[windowsdesktop](#windowsdesktop) </br>[winforms](#winforms) </br>[wpf](#wpf) </br> ## aspnetcore </br>

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# Contributions to .NET Core 1.1

We're still working out the best way to present contributors and trying to be as accurate as possible. The list below is generated with the following command against each repo. The release qualifier is different from the example in some cases. Also, where multiple email addresses were returned for a single person, the counts were aggregated with the email address reported the most commits.

```bash

git shortlog -sne --no-merges --since {2016-05-20} --until {2016-11-08}

•••

When you navigate to a contributors commit page, the results are not filtered by release so more commits than are listed below will be shown.

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We're still working out the best way to present contributors and trying to be as accurate as possible. The list below is generated with the following command listed below in an attempt to capture all contributions which have gone into .NET Core 2.0 Preview 2. Where multiple email addresses were returned for a single person, the counts were aggregated with the email address reported the most commits.

## ```bash

git shortlog -sne --no-merges --since release/2.0.0@{2017-05-05} --until release/2.0.0@{2017-06-07}

When you navigate to a contributors commit page, the results are not filtered by release so more commits than are listed below will be shown.

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- \* [CoreCLR](#coreclr)
- \* [CoreFX](#corefx)

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# Contributions to .NET Core 2.0 Preview 1

We're still working out the best way to present contributors and trying to be as accurate as possible. The list below is

generated with the following command listed below in an attempt to capture all contributions which have gone into .NET Core 2.0 Preview 1. Where multiple email addresses were returned for a single person, the counts were aggregated with the email address reported the most commits.

```bash

git shortlog -sne --no-merges --since release/2.0.0@{2016-10-03} --until release/2.0.0@{2017-05-05} -committer="dotnet-bot" --invert-grep

When you navigate to a contributors commit page, the results are not filtered by release so more commits than are listed below will be shown.

\* [CLI](#cli)

\* [CoreCLR](#coreclr)

\* [CoreFX](#corefx)

\* [WCF](#wcf)

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# Contributions to .NET Core 2.1

The list below is generated with the following command listed below in an attempt to capture all contributions which have gone into .NET Core 2.1.

## ```bash

git shortlog -sne --no-merges --since 2017-11-16 --until 2018-05-15

When you navigate to a contributors commit page, the results are not filtered by release so more commits than are listed below will be shown.

\* [CLI](#cli)

\* [CoreCLR](#coreclr)

- \* [CoreFX](#corefx)
- \* [WCF](#wcf)

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## **1.11 libjpeg 6** 1.11.1 Available under license :

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\_\_\_\_\_

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This license applies to the libjpeg API library and associated programs (any code inherited from libjpeg, and any modifications to that code.)

- The Modified (3-clause) BSD License, which is listed below

This license covers the TurboJPEG API library and associated programs, as well as the build system.

- The zlib License, which is listed below

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The zlib License

\_\_\_\_\_

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## 1.12 sqlite 3.39.4

### 1.12.1 Available under license :

No license file was found, but licenses were detected in source scan.

/\* This will be more informative in a later version. \*/

Found in path(s):

\* /opt/cola/permits/1460468423\_1667577396.9698634/0/sqlite-amalgamation-3390400-1-zip/sqlite-amalgamation-3390400/shell.c

No license file was found, but licenses were detected in source scan.

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\*\* CAPI3REF: Configuration Options

\*\* KEYWORDS: {configuration option}

\*\*

\*\* These constants are the available integer configuration options that

\*\* can be passed as the first argument to the [sqlite3\_config()] interface.

\*\*

\*\* New configuration options may be added in future releases of SQLite.

\*\* Existing configuration options might be discontinued. Applications

\*\* should check the return code from [sqlite3\_config()] to make sure that

\*\* the call worked. The [sqlite3\_config()] interface will return a

\*\* non-zero [error code] if a discontinued or unsupported configuration option

\*\* is invoked.

\*\*

\*\* <dl>

- \*\* [[SQLITE\_CONFIG\_SINGLETHREAD]] <dt>SQLITE\_CONFIG\_SINGLETHREAD</dt>
- \*\* <dd>There are no arguments to this option. ^This option sets the
- \*\* [threading mode] to Single-thread. In other words, it disables
- \*\* all mutexing and puts SQLite into a mode where it can only be used
- \*\* by a single thread. ^If SQLite
- is compiled with
- \*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then
- \*\* it is not possible to change the [threading mode] from its default
- \*\* value of Single-thread and so [sqlite3\_config()] will return
- \*\* [SQLITE\_ERROR] if called with the SQLITE\_CONFIG\_SINGLETHREAD
- \*\* configuration option.</dd>
- \*\*

#### \*\* [[SQLITE\_CONFIG\_MULTITHREAD]] <dt>SQLITE\_CONFIG\_MULTITHREAD</dt>

- \*\* <dd>There are no arguments to this option. ^This option sets the
- \*\* [threading mode] to Multi-thread. In other words, it disables
- \*\* mutexing on [database connection] and [prepared statement] objects.
- \*\* The application is responsible for serializing access to
- \*\* [database connections] and [prepared statements]. But other mutexes
- \*\* are enabled so that SQLite will be safe to use in a multi-threaded
- \*\* environment as long as no two threads attempt to use the same
- \*\* [database connection] at the same time. ^If SQLite is compiled with
- \*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then
- \*\* it is not possible to set the Multi-thread [threading mode] and
- \*\* [sqlite3\_config()] will return [SQLITE\_ERROR] if called with the
- \*\* SQLITE\_CONFIG\_MULTITHREAD configuration option.</dd>
- \*\*

\*\* [[SQLITE\_CONFIG\_SERIALIZED]] <dt>SQLITE\_CONFIG\_SERIALIZED</dt>

- $\ast\ast$  <dd>There are no arguments to this option. ^This option sets the
- \*\* [threading mode] to Serialized. In other words, this option enables
- \*\* all mutexes including the recursive
- \*\* mutexes on [database connection] and [prepared statement] objects.
- \*\* In this mode (which is the default when SQLite is compiled with
- \*\* [SQLITE\_THREADSAFE=1]) the SQLite library will itself serialize access
- \*\* to [database connections] and [prepared statements] so that the
- \*\* application is free to use the same [database connection] or the
- \*\* same [prepared statement] in different threads at the same time.
- \*\* ^If SQLite is compiled with
- \*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then
- \*\* it is not possible to set the
- Serialized [threading mode] and
- \*\* [sqlite3\_config()] will return [SQLITE\_ERROR] if called with the
- \*\* SQLITE\_CONFIG\_SERIALIZED configuration option.</dd>

\*\*

\*\* [[SQLITE\_CONFIG\_MALLOC]] <dt>SQLITE\_CONFIG\_MALLOC</dt>

\*\* <dd> ^(The SQLITE\_CONFIG\_MALLOC option takes a single argument which is

- \*\* a pointer to an instance of the [sqlite3\_mem\_methods] structure.
- \*\* The argument specifies
- \*\* alternative low-level memory allocation routines to be used in place of
- \*\* the memory allocation routines built into SQLite.)^ ^SQLite makes
- \*\* its own private copy of the content of the [sqlite3\_mem\_methods] structure
- \*\* before the [sqlite3\_config()] call returns.</dd>
- \*\*

#### \*\* [[SQLITE\_CONFIG\_GETMALLOC]] <dt>SQLITE\_CONFIG\_GETMALLOC</dt>

- \*\* <dd> ^(The SQLITE\_CONFIG\_GETMALLOC option takes a single argument which
- \*\* is a pointer to an instance of the [sqlite3\_mem\_methods] structure.
- \*\* The [sqlite3\_mem\_methods]
- \*\* structure is filled with the currently defined memory allocation routines.)^
- \*\* This option can
- be used to overload the default memory allocation
- \*\* routines with a wrapper that simulations memory allocation failure or
- \*\* tracks memory usage, for example. </dd>

\*\*

```
** [[SQLITE_CONFIG_SMALL_MALLOC]] <dt>SQLITE_CONFIG_SMALL_MALLOC</dt>
```

- \*\* <dd> ^The SQLITE\_CONFIG\_SMALL\_MALLOC option takes single argument of
- \*\* type int, interpreted as a boolean, which if true provides a hint to
- \*\* SQLite that it should avoid large memory allocations if possible.
- \*\* SQLite will run faster if it is free to make large memory allocations,
- \*\* but some application might prefer to run slower in exchange for
- \*\* guarantees about memory fragmentation that are possible if large
- \*\* allocations are avoided. This hint is normally off.
- \*\* </dd>

\*\*

#### \*\* [[SQLITE\_CONFIG\_MEMSTATUS]] <dt>SQLITE\_CONFIG\_MEMSTATUS</dt>

- \*\* <dd> ^The SQLITE\_CONFIG\_MEMSTATUS option takes single argument of type int,
- \*\* interpreted as a boolean, which enables or disables the collection of

\*\* memory allocation statistics. ^(When memory allocation

statistics are

- \*\* disabled, the following SQLite interfaces become non-operational:
- \*\*
- \*\* [sqlite3\_hard\_heap\_limit64()]
- \*\* [sqlite3\_memory\_used()]
- \*\* [sqlite3\_memory\_highwater()]
- \*\* [sqlite3\_soft\_heap\_limit64()]
- \*\* [sqlite3\_status64()]
- \*\* )^
- \*\* ^Memory allocation statistics are enabled by default unless SQLite is
- \*\* compiled with [SQLITE\_DEFAULT\_MEMSTATUS]=0 in which case memory
- \*\* allocation statistics are disabled by default.

\*\* </dd>

\*\*

- \*\* [[SQLITE\_CONFIG\_SCRATCH]] <dt>SQLITE\_CONFIG\_SCRATCH</dt>
- \*\* <dd> The SQLITE\_CONFIG\_SCRATCH option is no longer used.

```
** </dd>
```

\*\*

\*\* [[SQLITE CONFIG PAGECACHE]] <dt>SQLITE CONFIG PAGECACHE</dt> \*\* <dd> ^The SQLITE\_CONFIG\_PAGECACHE option specifies a memory pool \*\* that SQLite can use for the database page cache with the default page \*\* cache implementation. \*\* This configuration option is a no-op if an application-defined page \*\* cache implementation is loaded using the [SQLITE CONFIG PCACHE2]. \*\* ^There are three arguments to SQLITE CONFIG PAGECACHE: A pointer to \*\* 8-byte aligned memory (pMem), the size of each page cache line (sz), \*\* and the number of cache lines (N). \*\* The sz argument should be the size of the largest database page \*\* (a power of two between 512 and 65536) plus some extra bytes for each \*\* page header. ^The number of extra bytes needed by the page header \*\* can be determined using [SQLITE CONFIG PCACHE HDRSZ]. \*\* ^It is harmless, apart from the wasted memory, \*\* for the sz parameter to be larger than necessary. The pMem \*\* argument must be either a NULL pointer or a pointer to an 8-byte \*\* aligned block of memory of at least sz\*N bytes, otherwise \*\* subsequent behavior is undefined. \*\* ^When pMem is not NULL, SQLite will strive to use the memory provided \*\* to satisfy page cache needs, falling back to [sqlite3\_malloc()] if \*\* a page cache line is larger than sz bytes or if all of the pMem buffer \*\* is exhausted. \*\* ^If pMem is NULL and N is non-zero, then each database connection \*\* does an initial bulk allocation for page cache memory \*\* from [sqlite3 malloc()] sufficient for N cache lines if N is positive or \*\* of -1024\*N bytes if N is negative, . ^If additional \*\* page cache memory is needed beyond what is provided by the initial \*\* allocation, then SQLite goes to [sqlite3 malloc()] separately for each \*\* additional cache line. </dd> \*\* \*\* [[SQLITE CONFIG HEAP]] <dt>SQLITE CONFIG HEAP</dt> \*\* <dd> ^The SQLITE CONFIG HEAP option specifies a static memory buffer \*\* that SQLite will use for all of its dynamic memory allocation needs \*\* beyond those provided for by [SQLITE\_CONFIG\_PAGECACHE]. \*\* ^The SQLITE\_CONFIG\_HEAP option is only available if SQLite is compiled \*\* with either [SQLITE\_ENABLE\_MEMSYS3] or [SQLITE\_ENABLE\_MEMSYS5] and returns \*\* [SQLITE\_ERROR] if invoked otherwise. \*\* ^There are three arguments to SOLITE CONFIG HEAP: \*\* An 8-byte aligned pointer to the memory, \*\* the number of bytes in the memory buffer, and the minimum allocation size. \*\* ^If the first pointer (the memory pointer) is NULL, then SQLite reverts \*\* to using its default memory allocator (the system malloc() implementation),

- \*\* memory pointer is not NULL then the alternative memory
- \*\* allocator is engaged to handle all of SQLites memory allocation needs.
- \*\* The first pointer (the memory pointer) must be aligned to an 8-byte
- \*\* boundary or subsequent behavior of SQLite will be undefined.
- \*\* The minimum allocation size is capped at 2\*\*12. Reasonable values
- \*\* for the minimum allocation size are 2\*\*5 through 2\*\*8.</dd>
- \*\*
- \*\* [[SQLITE\_CONFIG\_MUTEX]] <dt>SQLITE\_CONFIG\_MUTEX</dt>
- \*\* <dd> ^(The SQLITE\_CONFIG\_MUTEX option takes a single argument which is a
- \*\* pointer to an instance of the [sqlite3\_mutex\_methods] structure.
- \*\* The argument specifies alternative low-level mutex routines to be used
- \*\* in place the mutex routines built into SQLite.)^ ^SQLite makes a copy of \*\* the
- content of the [sqlite3\_mutex\_methods] structure before the call to
- \*\* [sqlite3\_config()] returns. ^If SQLite is compiled with
- \*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then
- \*\* the entire mutexing subsystem is omitted from the build and hence calls to
- \*\* [sqlite3\_config()] with the SQLITE\_CONFIG\_MUTEX configuration option will
- \*\* return [SQLITE\_ERROR].</dd>
- \*\*

\*\* [[SQLITE\_CONFIG\_GETMUTEX]] <dt>SQLITE\_CONFIG\_GETMUTEX</dt>

- \*\* <dd> ^(The SQLITE\_CONFIG\_GETMUTEX option takes a single argument which
- \*\* is a pointer to an instance of the [sqlite3\_mutex\_methods] structure. The
- \*\* [sqlite3\_mutex\_methods]
- \*\* structure is filled with the currently defined mutex routines.)^
- \*\* This option can be used to overload the default mutex allocation
- \*\* routines with a wrapper used to track mutex usage for performance
- \*\* profiling or testing, for example. ^If SQLite is compiled with
- \*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then \*\* the entire mutexing
- subsystem is omitted from the build and hence calls to
- \*\* [sqlite3\_config()] with the SQLITE\_CONFIG\_GETMUTEX configuration option will
- \*\* return [SQLITE\_ERROR].</dd>
- \*\*
- \*\* [[SQLITE\_CONFIG\_LOOKASIDE]] <dt>SQLITE\_CONFIG\_LOOKASIDE</dt>
- \*\* <dd> ^(The SQLITE\_CONFIG\_LOOKASIDE option takes two arguments that determine
- \*\* the default size of lookaside memory on each [database connection].
- \*\* The first argument is the
- \*\* size of each lookaside buffer slot and the second is the number of
- \*\* slots allocated to each database connection.)^ ^(SQLITE\_CONFIG\_LOOKASIDE
- \*\* sets the <i>default</i> lookaside size. The [SQLITE\_DBCONFIG\_LOOKASIDE]
- \*\* option to [sqlite3\_db\_config()] can be used to change the lookaside
- \*\* configuration on individual connections.)^ </dd>
- \*\*

\*\* [[SQLITE\_CONFIG\_PCACHE2]] <dt>SQLITE\_CONFIG\_PCACHE2</dt>

- \*\* <dd> ^(The SQLITE\_CONFIG\_PCACHE2 option takes a single argument which is
- \*\* a pointer to an [sqlite3\_pcache\_methods2] object. This object specifies
- \*\* the interface to a custom

page cache implementation.)^

\*\* ^SQLite makes a copy of the [sqlite3\_pcache\_methods2] object.</dd>

\*\*

- \*\* [[SQLITE\_CONFIG\_GETPCACHE2]] <dt>SQLITE\_CONFIG\_GETPCACHE2</dt>
- \*\* <dd> ^(The SQLITE\_CONFIG\_GETPCACHE2 option takes a single argument which
- \*\* is a pointer to an [sqlite3\_pcache\_methods2] object. SQLite copies of
- \*\* the current page cache implementation into that object.)^ </dd>
- \*\*
- \*\* [[SQLITE\_CONFIG\_LOG]] <dt>SQLITE\_CONFIG\_LOG</dt>

\*\* <dd> The SQLITE\_CONFIG\_LOG option is used to configure the SQLite \*\* global [error log].

- \*\* (^The SQLITE\_CONFIG\_LOG option takes two arguments: a pointer to a
- \*\* function with a call signature of void(\*)(void\*,int,const char\*),
- \*\* and a pointer to void. ^If the function pointer is not NULL, it is
- \*\* invoked by [sqlite3\_log()] to process each logging event. ^If the
- \*\* function pointer is NULL, the [sqlite3\_log()] interface becomes a no-op.
- \*\* ^The void pointer that is the second argument to SQLITE\_CONFIG\_LOG is
- \*\* passed through as the first parameter
- to the application-defined logger
- \*\* function whenever that function is invoked. ^The second parameter to
- \*\* the logger function is a copy of the first parameter to the corresponding
- \*\* [sqlite3\_log()] call and is intended to be a [result code] or an
- \*\* [extended result code]. ^The third parameter passed to the logger is
- \*\* log message after formatting via [sqlite3\_snprintf()].
- \*\* The SQLite logging interface is not reentrant; the logger function
- \*\* supplied by the application must not invoke any SQLite interface.
- \*\* In a multi-threaded application, the application-defined logger
- \*\* function must be threadsafe. </dd>
- \*\*

#### \*\* [[SQLITE\_CONFIG\_URI]] <dt>SQLITE\_CONFIG\_URI

- \*\* <dd>^(The SQLITE\_CONFIG\_URI option takes a single argument of type int.
- \*\* If non-zero, then URI handling is globally enabled. If the parameter is zero,
- \*\* then URI handling is globally disabled.)^ ^If URI handling is globally
- \*\* enabled, all filenames passed to [sqlite3\_open()], [sqlite3\_open\_v2()],
- \*\* [sqlite3\_open16()]
- or
- \*\* specified as part of [ATTACH] commands are interpreted as URIs, regardless
- \*\* of whether or not the [SQLITE\_OPEN\_URI] flag is set when the database
- \*\* connection is opened. ^If it is globally disabled, filenames are
- \*\* only interpreted as URIs if the SQLITE\_OPEN\_URI flag is set when the
- \*\* database connection is opened. ^(By default, URI handling is globally
- \*\* disabled. The default value may be changed by compiling with the
- \*\* [SQLITE\_USE\_URI] symbol defined.)^

\*\*

- \*\* [[SQLITE\_CONFIG\_COVERING\_INDEX\_SCAN]] <dt>SQLITE\_CONFIG\_COVERING\_INDEX\_SCAN
- \*\* <dd>^The SQLITE\_CONFIG\_COVERING\_INDEX\_SCAN option takes a single integer
- \*\* argument which is interpreted as a boolean in order to enable or disable
- \*\* the use of covering indices for full table scans in the query optimizer.

\*\* ^The default setting is determined

- \*\* by the [SQLITE\_ALLOW\_COVERING\_INDEX\_SCAN] compile-time option, or is "on"
- \*\* if that compile-time option is omitted.
- \*\* The ability to disable the use of covering indices

for full table scans

\*\* is because some incorrectly coded legacy applications might malfunction

\*\* when the optimization is enabled. Providing the ability to

- \*\* disable the optimization allows the older, buggy application code to work
- \*\* without change even with newer versions of SQLite.

\*\*

#### \*\* [[SQLITE\_CONFIG\_PCACHE]] [[SQLITE\_CONFIG\_GETPCACHE]]

#### \*\* <dt>SQLITE\_CONFIG\_PCACHE and SQLITE\_CONFIG\_GETPCACHE

\*\* <dd> These options are obsolete and should not be used by new code.

\*\* They are retained for backwards compatibility but are now no-ops.

- \*\* </dd>
- \*\*

#### \*\* [[SQLITE\_CONFIG\_SQLLOG]]

\*\* <dt>SQLITE\_CONFIG\_SQLLOG

\*\* <dd>This option is only available if sqlite is compiled with the

\*\* [SQLITE\_ENABLE\_SQLLOG] pre-processor macro defined. The first argument should

\*\* be a pointer to a function of type void(\*)(void\*,sqlite3\*,const char\*, int).

\*\* The second should be of type (void\*). The callback is invoked by the library

\*\* in three separate circumstances, identified by the value passed as the

\*\*

fourth parameter. If the fourth parameter is 0, then the database connection

\*\* passed as the second argument has just been opened. The third argument

\*\* points to a buffer containing the name of the main database file. If the

\*\* fourth parameter is 1, then the SQL statement that the third parameter

\*\* points to has just been executed. Or, if the fourth parameter is 2, then

\*\* the connection being passed as the second parameter is being closed. The

\*\* third parameter is passed NULL In this case. An example of using this

\*\* configuration option can be seen in the "test\_sqllog.c" source file in

\*\* the canonical SQLite source tree.</dd>

\*\*

\*\* [[SQLITE\_CONFIG\_MMAP\_SIZE]]

\*\* <dt>SQLITE\_CONFIG\_MMAP\_SIZE

\*\* <dd>^SQLITE\_CONFIG\_MMAP\_SIZE takes two 64-bit integer (sqlite3\_int64) values

\*\* that are the default mmap size limit (the default setting for

\*\* [PRAGMA mmap\_size]) and the maximum allowed mmap size limit.

\*\* ^The default setting can be overridden by each database connection using

\*\* either

the [PRAGMA mmap\_size] command, or by using the

\*\* [SQLITE\_FCNTL\_MMAP\_SIZE] file control. ^(The maximum allowed mmap size

\*\* will be silently truncated if necessary so that it does not exceed the

\*\* compile-time maximum mmap size set by the

\*\* [SQLITE\_MAX\_MMAP\_SIZE] compile-time option.)^

\*\* ^If either argument to this option is negative, then that argument is

\*\* changed to its compile-time default.

#### \*\* [[SQLITE\_CONFIG\_WIN32\_HEAPSIZE]]

#### \*\* <dt>SQLITE\_CONFIG\_WIN32\_HEAPSIZE

\*\* <dd>^The SQLITE\_CONFIG\_WIN32\_HEAPSIZE option is only available if SQLite is

\*\* compiled for Windows with the [SQLITE\_WIN32\_MALLOC] pre-processor macro

\*\* defined. ^SQLITE\_CONFIG\_WIN32\_HEAPSIZE takes a 32-bit unsigned integer value

\*\* that specifies the maximum size of the created heap.

\*\*

\*\* [[SQLITE\_CONFIG\_PCACHE\_HDRSZ]]

\*\* <dt>SQLITE\_CONFIG\_PCACHE\_HDRSZ

\*\* <dd>^The SQLITE\_CONFIG\_PCACHE\_HDRSZ option takes a single parameter which
\*\* is a pointer to an integer and writes into that integer the number of extra
\*\*

bytes per page required for each page in [SQLITE\_CONFIG\_PAGECACHE].

\*\* The amount of extra space required can change depending on the compiler,

\*\* target platform, and SQLite version.

\*\*

\*\* [[SQLITE\_CONFIG\_PMASZ]]

\*\* <dt>SQLITE\_CONFIG\_PMASZ

\*\* <dd>^The SQLITE\_CONFIG\_PMASZ option takes a single parameter which

\*\* is an unsigned integer and sets the "Minimum PMA Size" for the multithreaded

\*\* sorter to that integer. The default minimum PMA Size is set by the

\*\* [SQLITE\_SORTER\_PMASZ] compile-time option. New threads are launched

\*\* to help with sort operations when multithreaded sorting

\*\* is enabled (using the [PRAGMA threads] command) and the amount of content

\*\* to be sorted exceeds the page size times the minimum of the

\*\* [PRAGMA cache\_size] setting and this value.

\*\*

\*\* [[SQLITE\_CONFIG\_STMTJRNL\_SPILL]]

\*\* <dt>SQLITE\_CONFIG\_STMTJRNL\_SPILL

\*\* <dd>^The SQLITE\_CONFIG\_STMTJRNL\_SPILL option takes a single parameter which

\*\* becomes the [statement journal] spill-to-disk threshold.

\*\*

[Statement journals] are held in memory until their size (in bytes)

\*\* exceeds this threshold, at which point they are written to disk.

\*\* Or if the threshold is -1, statement journals are always held

\*\* exclusively in memory.

\*\* Since many statement journals never become large, setting the spill

\*\* threshold to a value such as 64KiB can greatly reduce the amount of

\*\* I/O required to support statement rollback.

\*\* The default value for this setting is controlled by the

\*\* [SQLITE\_STMTJRNL\_SPILL] compile-time option.

\*\*

\*\* [[SQLITE\_CONFIG\_SORTERREF\_SIZE]]

\*\* <dt>SQLITE\_CONFIG\_SORTERREF\_SIZE

\*\* <dd>The SQLITE\_CONFIG\_SORTERREF\_SIZE option accepts a single parameter

\*\* of type (int) - the new value of the sorter-reference size threshold.

\*\* Usually, when SQLite uses an external sort to order records according

\*\* to an ORDER BY clause, all fields required by the caller are present in the

\*\* sorted records. However, if SQLite determines based on the declared type

\*\* of a table column that

its values are likely to be very large - larger

\*\* than the configured sorter-reference size threshold - then a reference

\*\* is stored in each sorted record and the required column values loaded

\*\* from the database as records are returned in sorted order. The default

\*\* value for this option is to never use this optimization. Specifying a

\*\* negative value for this option restores the default behaviour.

\*\* This option is only available if SQLite is compiled with the

\*\* [SQLITE\_ENABLE\_SORTER\_REFERENCES] compile-time option.

\*\*

\*\* [[SQLITE\_CONFIG\_MEMDB\_MAXSIZE]]

\*\* <dt>SQLITE\_CONFIG\_MEMDB\_MAXSIZE

\*\* <dd>The SQLITE\_CONFIG\_MEMDB\_MAXSIZE option accepts a single parameter

\*\* [sqlite3\_int64] parameter which is the default maximum size for an in-memory

\*\* database created using [sqlite3\_deserialize()]. This default maximum

\*\* size can be adjusted up or down for individual databases using the

\*\* [SQLITE\_FCNTL\_SIZE\_LIMIT] [sqlite3\_file\_control|file-control]. If this

\*\* configuration setting is

never used, then the default maximum is determined

\*\* by the [SQLITE\_MEMDB\_DEFAULT\_MAXSIZE] compile-time option. If that

\*\* compile-time option is not set, then the default maximum is 1073741824.

\*\* </dl>

\*/

Found in path(s):

\* /opt/cola/permits/1460468423\_1667577396.9698634/0/sqlite-amalgamation-3390400-1-zip/sqlite-amalgamation-3390400/sqlite3.h

No license file was found, but licenses were detected in source scan.

/\*

\*\* CAPI3REF: Configuration Options

\*\* KEYWORDS: {configuration option}

\*\*

\*\* These constants are the available integer configuration options that

\*\* can be passed as the first argument to the [sqlite3\_config()] interface.

\*\*

\*\* New configuration options may be added in future releases of SQLite.

\*\* Existing configuration options might be discontinued. Applications

\*\* should check the return code from [sqlite3\_config()] to make sure that

\*\* the call worked. The [sqlite3\_config()] interface will return a

\*\* non-zero [error code] if a discontinued or unsupported configuration option

\*\* is invoked.

\*\*

\*\* <dl>

\*\* [[SQLITE\_CONFIG\_SINGLETHREAD]] <dt>SQLITE\_CONFIG\_SINGLETHREAD</dt>

\*\* <dd>There are no arguments to this option. ^This option sets the

- \*\* [threading mode] to Single-thread. In other words, it disables
- \*\* all mutexing and puts SQLite into a mode where it can only be used
- \*\* by a single thread. ^If SQLite
- is compiled with

\*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then

- \*\* it is not possible to change the [threading mode] from its default
- \*\* value of Single-thread and so [sqlite3\_config()] will return
- \*\* [SQLITE\_ERROR] if called with the SQLITE\_CONFIG\_SINGLETHREAD
- \*\* configuration option.</dd>
- \*\*

#### \*\* [[SQLITE\_CONFIG\_MULTITHREAD]] <dt>SQLITE\_CONFIG\_MULTITHREAD</dt>

- \*\* <dd>There are no arguments to this option. ^This option sets the
- \*\* [threading mode] to Multi-thread. In other words, it disables
- \*\* mutexing on [database connection] and [prepared statement] objects.
- \*\* The application is responsible for serializing access to
- \*\* [database connections] and [prepared statements]. But other mutexes
- \*\* are enabled so that SQLite will be safe to use in a multi-threaded
- \*\* environment as long as no two threads attempt to use the same
- \*\* [database connection] at the same time. ^If SQLite is compiled with
- \*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then
- \*\* it is not possible to set the Multi-thread [threading mode] and
- \*\* [sqlite3\_config()] will return [SQLITE\_ERROR] if called with the
- \*\* SQLITE\_CONFIG\_MULTITHREAD configuration option.</dd>
- \*\*

\*\* [[SQLITE\_CONFIG\_SERIALIZED]] <dt>SQLITE\_CONFIG\_SERIALIZED</dt>

- \*\* <dd>There are no arguments to this option. ^This option sets the
- \*\* [threading mode] to Serialized. In other words, this option enables
- \*\* all mutexes including the recursive
- \*\* mutexes on [database connection] and [prepared statement] objects.
- \*\* In this mode (which is the default when SQLite is compiled with
- \*\* [SQLITE\_THREADSAFE=1]) the SQLite library will itself serialize access
- \*\* to [database connections] and [prepared statements] so that the
- \*\* application is free to use the same [database connection] or the
- \*\* same [prepared statement] in different threads at the same time.
- \*\* ^If SQLite is compiled with

\*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then

- \*\* it is not possible to set the
- Serialized [threading mode] and
- \*\* [sqlite3\_config()] will return [SQLITE\_ERROR] if called with the
- \*\* SQLITE\_CONFIG\_SERIALIZED configuration option.</dd>
- \*\*

\*\* [[SQLITE\_CONFIG\_MALLOC]] <dt>SQLITE\_CONFIG\_MALLOC</dt>

- \*\* <dd> ^(The SQLITE\_CONFIG\_MALLOC option takes a single argument which is
- \*\* a pointer to an instance of the [sqlite3\_mem\_methods] structure.
- \*\* The argument specifies
- \*\* alternative low-level memory allocation routines to be used in place of
- \*\* the memory allocation routines built into SQLite.)^ ^SQLite makes

\*\* its own private copy of the content of the [sqlite3\_mem\_methods] structure

\*\* before the [sqlite3\_config()] call returns.</dd>

\*\*

\*\* [[SQLITE\_CONFIG\_GETMALLOC]] <dt>SQLITE\_CONFIG\_GETMALLOC</dt>

\*\* <dd> ^(The SQLITE\_CONFIG\_GETMALLOC option takes a single argument which

```
** is a pointer to an instance of the [sqlite3_mem_methods] structure.
```

\*\* The [sqlite3\_mem\_methods]

```
** structure is filled with the currently defined memory allocation routines.)^
```

\*\* This option can

be used to overload the default memory allocation

\*\* routines with a wrapper that simulations memory allocation failure or

\*\* tracks memory usage, for example. </dd>

\*\*

```
** [[SQLITE_CONFIG_SMALL_MALLOC]] <dt>SQLITE_CONFIG_SMALL_MALLOC</dt>
```

\*\* <dd> ^The SQLITE\_CONFIG\_SMALL\_MALLOC option takes single argument of

\*\* type int, interpreted as a boolean, which if true provides a hint to

\*\* SQLite that it should avoid large memory allocations if possible.

\*\* SQLite will run faster if it is free to make large memory allocations,

\*\* but some application might prefer to run slower in exchange for

\*\* guarantees about memory fragmentation that are possible if large

\*\* allocations are avoided. This hint is normally off.

\*\* </dd>

\*\*

\*\* [[SQLITE\_CONFIG\_MEMSTATUS]] <dt>SQLITE\_CONFIG\_MEMSTATUS</dt>

\*\* <dd> ^The SQLITE\_CONFIG\_MEMSTATUS option takes single argument of type int,

\*\* interpreted as a boolean, which enables or disables the collection of

\*\* memory allocation statistics. ^(When memory allocation

statistics are

\*\* disabled, the following SQLite interfaces become non-operational:

\*\*

\*\* [sqlite3\_hard\_heap\_limit64()]

\*\* [sqlite3\_memory\_used()]

\*\* [sqlite3\_memory\_highwater()]

\*\* [sqlite3\_soft\_heap\_limit64()]

```
** [sqlite3_status64()]
```

\*\* )^

\*\* ^Memory allocation statistics are enabled by default unless SQLite is

\*\* compiled with [SQLITE\_DEFAULT\_MEMSTATUS]=0 in which case memory

```
** allocation statistics are disabled by default.
```

\*\* </dd>

\*\*

\*\* [[SQLITE\_CONFIG\_SCRATCH]] <dt>SQLITE\_CONFIG\_SCRATCH</dt>

\*\* <dd> The SQLITE\_CONFIG\_SCRATCH option is no longer used.

\*\* </dd>

\*\*

\*\* [[SQLITE\_CONFIG\_PAGECACHE]] <dt>SQLITE\_CONFIG\_PAGECACHE</dt>

\*\* <dd> ^The SQLITE\_CONFIG\_PAGECACHE option specifies a memory pool

\*\* that SQLite can use for the database page cache with the default page

- \*\* cache implementation.
- \*\* This configuration option is a no-op if an application-defined page
- \*\* cache implementation is loaded using the [SQLITE\_CONFIG\_PCACHE2].

\*\*

- ^There are three arguments to SQLITE\_CONFIG\_PAGECACHE: A pointer to
- \*\* 8-byte aligned memory (pMem), the size of each page cache line (sz),
- \*\* and the number of cache lines (N).
- \*\* The sz argument should be the size of the largest database page
- \*\* (a power of two between 512 and 65536) plus some extra bytes for each
- \*\* page header. ^The number of extra bytes needed by the page header
- \*\* can be determined using [SQLITE\_CONFIG\_PCACHE\_HDRSZ].
- \*\* ^It is harmless, apart from the wasted memory,
- $\ast\ast$  for the sz parameter to be larger than necessary. The pMem
- \*\* argument must be either a NULL pointer or a pointer to an 8-byte
- \*\* aligned block of memory of at least sz\*N bytes, otherwise
- \*\* subsequent behavior is undefined.
- \*\* ^When pMem is not NULL, SQLite will strive to use the memory provided
- \*\* to satisfy page cache needs, falling back to [sqlite3\_malloc()] if
- \*\* a page cache line is larger than sz bytes or if all of the pMem buffer
- \*\* is exhausted.
- \*\* ^If pMem is NULL and N is non-zero, then
- each database connection
- \*\* does an initial bulk allocation for page cache memory
- \*\* from [sqlite3\_malloc()] sufficient for N cache lines if N is positive or
- \*\* of -1024\*N bytes if N is negative, . ^If additional
- \*\* page cache memory is needed beyond what is provided by the initial
- \*\* allocation, then SQLite goes to [sqlite3\_malloc()] separately for each
- \*\* additional cache line. </dd>
- \*\*
- \*\* [[SQLITE CONFIG HEAP]] <dt>SQLITE CONFIG HEAP</dt>
- \*\* <dd> ^The SQLITE\_CONFIG\_HEAP option specifies a static memory buffer
- \*\* that SQLite will use for all of its dynamic memory allocation needs
- \*\* beyond those provided for by [SQLITE\_CONFIG\_PAGECACHE].
- \*\* ^The SQLITE\_CONFIG\_HEAP option is only available if SQLite is compiled
- \*\* with either [SQLITE\_ENABLE\_MEMSYS3] or [SQLITE\_ENABLE\_MEMSYS5] and returns
- \*\* [SQLITE\_ERROR] if invoked otherwise.
- \*\* ^There are three arguments to SQLITE\_CONFIG\_HEAP:
- \*\* An 8-byte aligned pointer to the memory,
- \*\* the number of bytes in the memory buffer, and the minimum

allocation size.

- \*\* ^If the first pointer (the memory pointer) is NULL, then SQLite reverts
- \*\* to using its default memory allocator (the system malloc() implementation),
- \*\* undoing any prior invocation of [SQLITE\_CONFIG\_MALLOC]. ^If the
- \*\* memory pointer is not NULL then the alternative memory
- \*\* allocator is engaged to handle all of SQLites memory allocation needs.
- \*\* The first pointer (the memory pointer) must be aligned to an 8-byte
- \*\* boundary or subsequent behavior of SQLite will be undefined.
- \*\* The minimum allocation size is capped at 2\*\*12. Reasonable values

\*\* for the minimum allocation size are 2\*\*5 through 2\*\*8.</dd>

\*\*

\*\* [[SQLITE\_CONFIG\_MUTEX]] <dt>SQLITE\_CONFIG\_MUTEX</dt>

\*\* <dd> ^(The SQLITE\_CONFIG\_MUTEX option takes a single argument which is a

\*\* pointer to an instance of the [sqlite3\_mutex\_methods] structure.

\*\* The argument specifies alternative low-level mutex routines to be used

\*\* in place the mutex routines built into SQLite.)^ ^SQLite makes a copy of \*\* the

content of the [sqlite3\_mutex\_methods] structure before the call to

\*\* [sqlite3\_config()] returns. ^If SQLite is compiled with

\*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then

\*\* the entire mutexing subsystem is omitted from the build and hence calls to

\*\* [sqlite3\_config()] with the SQLITE\_CONFIG\_MUTEX configuration option will

\*\* return [SQLITE\_ERROR].</dd>

\*\*

\*\* [[SQLITE\_CONFIG\_GETMUTEX]] <dt>SQLITE\_CONFIG\_GETMUTEX</dt>

\*\* <dd> ^(The SQLITE\_CONFIG\_GETMUTEX option takes a single argument which

\*\* is a pointer to an instance of the [sqlite3\_mutex\_methods] structure. The

\*\* [sqlite3\_mutex\_methods]

\*\* structure is filled with the currently defined mutex routines.)^

\*\* This option can be used to overload the default mutex allocation

\*\* routines with a wrapper used to track mutex usage for performance

\*\* profiling or testing, for example. ^If SQLite is compiled with

\*\* the [SQLITE\_THREADSAFE | SQLITE\_THREADSAFE=0] compile-time option then

\*\* the entire mutexing

subsystem is omitted from the build and hence calls to

\*\* [sqlite3\_config()] with the SQLITE\_CONFIG\_GETMUTEX configuration option will

\*\* return [SQLITE\_ERROR].</dd>

\*\*

\*\* [[SQLITE\_CONFIG\_LOOKASIDE]] <dt>SQLITE\_CONFIG\_LOOKASIDE</dt>

\*\* <dd> ^(The SQLITE\_CONFIG\_LOOKASIDE option takes two arguments that determine

\*\* the default size of lookaside memory on each [database connection].

\*\* The first argument is the

\*\* size of each lookaside buffer slot and the second is the number of

\*\* slots allocated to each database connection.)^ ^(SQLITE\_CONFIG\_LOOKASIDE

\*\* sets the <i>default</i> lookaside size. The [SQLITE\_DBCONFIG\_LOOKASIDE]

\*\* option to [sqlite3\_db\_config()] can be used to change the lookaside

\*\* configuration on individual connections.)^ </dd>

\*\*

\*\* [[SQLITE\_CONFIG\_PCACHE2]] <dt>SQLITE\_CONFIG\_PCACHE2</dt>

\*\* <dd> ^(The SQLITE\_CONFIG\_PCACHE2 option takes a single argument which is

\*\* a pointer to an [sqlite3\_pcache\_methods2] object. This object specifies

\*\* the interface to a custom

page cache implementation.)^

\*\* ^SQLite makes a copy of the [sqlite3\_pcache\_methods2] object.</dd>

\*\*

\*\* [[SQLITE\_CONFIG\_GETPCACHE2]] <dt>SQLITE\_CONFIG\_GETPCACHE2</dt>

\*\* <dd> ^(The SQLITE\_CONFIG\_GETPCACHE2 option takes a single argument which

\*\* is a pointer to an [sqlite3\_pcache\_methods2] object. SQLite copies of

\*\* the current page cache implementation into that object.)^ </d>

\*\*

- \*\* [[SQLITE\_CONFIG\_LOG]] <dt>SQLITE\_CONFIG\_LOG</dt>
- \*\* <dd> The SQLITE\_CONFIG\_LOG option is used to configure the SQLite \*\* global [error log].
- \*\* (^The SQLITE\_CONFIG\_LOG option takes two arguments: a pointer to a
- \*\* function with a call signature of void(\*)(void\*,int,const char\*),
- \*\* and a pointer to void. ^If the function pointer is not NULL, it is
- \*\* invoked by [sqlite3\_log()] to process each logging event. ^If the
- \*\* function pointer is NULL, the [sqlite3\_log()] interface becomes a no-op.
- \*\* ^The void pointer that is the second argument to SQLITE\_CONFIG\_LOG is
- \*\* passed through as the first parameter
- to the application-defined logger
- \*\* function whenever that function is invoked. ^The second parameter to
- \*\* the logger function is a copy of the first parameter to the corresponding
- \*\* [sqlite3\_log()] call and is intended to be a [result code] or an
- \*\* [extended result code]. ^The third parameter passed to the logger is
- \*\* log message after formatting via [sqlite3\_snprintf()].
- \*\* The SQLite logging interface is not reentrant; the logger function
- \*\* supplied by the application must not invoke any SQLite interface.
- \*\* In a multi-threaded application, the application-defined logger
- \*\* function must be threadsafe. </dd>
- \*\*
- \*\* [[SQLITE\_CONFIG\_URI]] <dt>SQLITE\_CONFIG\_URI
- \*\* <dd>^(The SQLITE\_CONFIG\_URI option takes a single argument of type int.
- \*\* If non-zero, then URI handling is globally enabled. If the parameter is zero,
- \*\* then URI handling is globally disabled.)^ ^If URI handling is globally
- \*\* enabled, all filenames passed to [sqlite3\_open()], [sqlite3\_open\_v2()],
- \*\* [sqlite3\_open16()]
- or
- \*\* specified as part of [ATTACH] commands are interpreted as URIs, regardless
- \*\* of whether or not the [SQLITE\_OPEN\_URI] flag is set when the database
- \*\* connection is opened. ^If it is globally disabled, filenames are
- \*\* only interpreted as URIs if the SQLITE\_OPEN\_URI flag is set when the
- \*\* database connection is opened. ^(By default, URI handling is globally
- \*\* disabled. The default value may be changed by compiling with the
- \*\* [SQLITE\_USE\_URI] symbol defined.)^
- \*\*

```
** [[SQLITE_CONFIG_COVERING_INDEX_SCAN]] <dt>SQLITE_CONFIG_COVERING_INDEX_SCAN
```

- \*\* <dd>^The SQLITE\_CONFIG\_COVERING\_INDEX\_SCAN option takes a single integer
- \*\* argument which is interpreted as a boolean in order to enable or disable
- \*\* the use of covering indices for full table scans in the query optimizer.
- \*\* ^The default setting is determined
- \*\* by the [SQLITE\_ALLOW\_COVERING\_INDEX\_SCAN] compile-time option, or is "on"
- \*\* if that compile-time option is omitted.
- \*\* The ability to disable the use of covering indices

for full table scans

\*\* is because some incorrectly coded legacy applications might malfunction

\*\* when the optimization is enabled. Providing the ability to

\*\* disable the optimization allows the older, buggy application code to work

\*\* without change even with newer versions of SQLite.

\*\*

#### \*\* [[SQLITE\_CONFIG\_PCACHE]] [[SQLITE\_CONFIG\_GETPCACHE]]

#### \*\* <dt>SQLITE\_CONFIG\_PCACHE and SQLITE\_CONFIG\_GETPCACHE

\*\* <dd> These options are obsolete and should not be used by new code.

\*\* They are retained for backwards compatibility but are now no-ops.

- \*\* </dd>
- \*\*

#### \*\* [[SQLITE\_CONFIG\_SQLLOG]]

\*\* <dt>SQLITE\_CONFIG\_SQLLOG

\*\* <dd>This option is only available if sqlite is compiled with the

\*\* [SQLITE\_ENABLE\_SQLLOG] pre-processor macro defined. The first argument should

\*\* be a pointer to a function of type void(\*)(void\*,sqlite3\*,const char\*, int).

\*\* The second should be of type (void\*). The callback is invoked by the library

\*\* in three separate circumstances, identified by the value passed as the \*\*

fourth parameter. If the fourth parameter is 0, then the database connection

\*\* passed as the second argument has just been opened. The third argument

\*\* points to a buffer containing the name of the main database file. If the

\*\* fourth parameter is 1, then the SQL statement that the third parameter

\*\* points to has just been executed. Or, if the fourth parameter is 2, then

\*\* the connection being passed as the second parameter is being closed. The

\*\* third parameter is passed NULL In this case. An example of using this

\*\* configuration option can be seen in the "test\_sqllog.c" source file in

- \*\* the canonical SQLite source tree.</dd>
- \*\*

\*\* [[SQLITE\_CONFIG\_MMAP\_SIZE]]

\*\* <dt>SQLITE\_CONFIG\_MMAP\_SIZE

\*\* <dd>^SQLITE\_CONFIG\_MMAP\_SIZE takes two 64-bit integer (sqlite3\_int64) values

\*\* that are the default mmap size limit (the default setting for

\*\* [PRAGMA mmap\_size]) and the maximum allowed mmap size limit.

\*\* ^The default setting can be overridden by each database connection using

\*\* either

the [PRAGMA mmap\_size] command, or by using the

\*\* [SQLITE\_FCNTL\_MMAP\_SIZE] file control. ^(The maximum allowed mmap size

\*\* will be silently truncated if necessary so that it does not exceed the

\*\* compile-time maximum mmap size set by the

\*\* [SQLITE\_MAX\_MMAP\_SIZE] compile-time option.)^

\*\* ^If either argument to this option is negative, then that argument is

\*\* changed to its compile-time default.

\*\*

\*\* [[SQLITE\_CONFIG\_WIN32\_HEAPSIZE]]

\*\* <dt>SQLITE\_CONFIG\_WIN32\_HEAPSIZE

\*\* <dd>^The SQLITE\_CONFIG\_WIN32\_HEAPSIZE option is only available if SQLite is

\*\* compiled for Windows with the [SQLITE\_WIN32\_MALLOC] pre-processor macro

\*\* defined. ^SQLITE\_CONFIG\_WIN32\_HEAPSIZE takes a 32-bit unsigned integer value

\*\* that specifies the maximum size of the created heap.

\*\*

\*\* [[SQLITE\_CONFIG\_PCACHE\_HDRSZ]]

\*\* <dt>SQLITE\_CONFIG\_PCACHE\_HDRSZ

\*\* <dd>^The SQLITE\_CONFIG\_PCACHE\_HDRSZ option takes a single parameter which

\*\* is a pointer to an integer and writes into that integer the number of extra \*\*

.....

bytes per page required for each page in [SQLITE\_CONFIG\_PAGECACHE].

\*\* The amount of extra space required can change depending on the compiler,

\*\* target platform, and SQLite version.

\*\*

\*\* [[SQLITE\_CONFIG\_PMASZ]]

\*\* <dt>SQLITE\_CONFIG\_PMASZ

\*\* <dd>^The SQLITE\_CONFIG\_PMASZ option takes a single parameter which

\*\* is an unsigned integer and sets the "Minimum PMA Size" for the multithreaded

\*\* sorter to that integer. The default minimum PMA Size is set by the

\*\* [SQLITE\_SORTER\_PMASZ] compile-time option. New threads are launched

\*\* to help with sort operations when multithreaded sorting

\*\* is enabled (using the [PRAGMA threads] command) and the amount of content

\*\* to be sorted exceeds the page size times the minimum of the

\*\* [PRAGMA cache\_size] setting and this value.

\*\*

\*\* [[SQLITE\_CONFIG\_STMTJRNL\_SPILL]]

\*\* <dt>SQLITE\_CONFIG\_STMTJRNL\_SPILL

\*\* <dd>^The SQLITE\_CONFIG\_STMTJRNL\_SPILL option takes a single parameter which

\*\* becomes the [statement journal] spill-to-disk threshold.

\*\*

[Statement journals] are held in memory until their size (in bytes)

\*\* exceeds this threshold, at which point they are written to disk.

\*\* Or if the threshold is -1, statement journals are always held

\*\* exclusively in memory.

\*\* Since many statement journals never become large, setting the spill

\*\* threshold to a value such as 64KiB can greatly reduce the amount of

\*\* I/O required to support statement rollback.

\*\* The default value for this setting is controlled by the

\*\* [SQLITE\_STMTJRNL\_SPILL] compile-time option.

\*\*

\*\* [[SQLITE\_CONFIG\_SORTERREF\_SIZE]]

\*\* <dt>SQLITE\_CONFIG\_SORTERREF\_SIZE

\*\* <dd>The SQLITE\_CONFIG\_SORTERREF\_SIZE option accepts a single parameter

\*\* of type (int) - the new value of the sorter-reference size threshold.

\*\* Usually, when SQLite uses an external sort to order records according

\*\* to an ORDER BY clause, all fields required by the caller are present in the

\*\* sorted records. However, if SQLite determines based on the declared type

\*\* of a table column that

its values are likely to be very large - larger

```
** than the configured sorter-reference size threshold - then a reference
```

\*\* is stored in each sorted record and the required column values loaded

```
** from the database as records are returned in sorted order. The default
```

\*\* value for this option is to never use this optimization. Specifying a

\*\* negative value for this option restores the default behaviour.

```
** This option is only available if SQLite is compiled with the
```

```
** [SQLITE_ENABLE_SORTER_REFERENCES] compile-time option.
```

```
**
```

\*\* [[SQLITE\_CONFIG\_MEMDB\_MAXSIZE]]

\*\* <dt>SQLITE\_CONFIG\_MEMDB\_MAXSIZE

```
** <dd>The SQLITE_CONFIG_MEMDB_MAXSIZE option accepts a single parameter
```

\*\* [sqlite3\_int64] parameter which is the default maximum size for an in-memory

\*\* database created using [sqlite3\_deserialize()]. This default maximum

\*\* size can be adjusted up or down for individual databases using the

\*\* [SQLITE\_FCNTL\_SIZE\_LIMIT] [sqlite3\_file\_control|file-control]. If this

\*\* configuration setting is

never used, then the default maximum is determined

```
** by the [SQLITE_MEMDB_DEFAULT_MAXSIZE] compile-time option. If that
```

\*\* compile-time option is not set, then the default maximum is 1073741824.

\*\* </dl>

\*/

```
/*
```

\*\* The "printf" code that follows dates from the 1980's. It is in

\*\* the public domain.

\*\*

\*\*

\*\* This file contains code for a set of "printf"-like routines. These

```
** routines format strings much like the printf() from the standard C
```

```
** library, though the implementation here has enhancements to support
```

\*\* SQLite.

```
/*
```

```
** 2004 May 22
```

\*\*

\*/

\*\* The author disclaims copyright to this source code. In place of

```
** a legal notice, here is a blessing:
```

\*\*

```
** May you do good and not evil.
```

\*\* May you find forgiveness for yourself and forgive others.

```
** May you share freely, never taking more than you give.
```

\*\*

\*\*

```
** This file
```

```
contains the VFS implementation for unix-like operating systems
```

\*\* include Linux, MacOSX, \*BSD, QNX, VxWorks, AIX, HPUX, and others.

```
**
```

\*\* There are actually several different VFS implementations in this file.

\*\* The differences are in the way that file locking is done. The default

\*\* implementation uses Posix Advisory Locks. Alternative implementations

\*\* use flock(), dot-files, various proprietary locking schemas, or simply

\*\* skip locking all together.

\*\*

- \*\* This source file is organized into divisions where the logic for various
- \*\* subfunctions is contained within the appropriate division. PLEASE
- \*\* KEEP THE STRUCTURE OF THIS FILE INTACT. New code should be placed
- \*\* in the correct division and should be clearly labeled.

\*\*

\*\* The layout of divisions is as follows:

\*\*

- \*\* \* General-purpose declarations and utility functions.
- \*\* \* Unique file ID logic used by VxWorks.
- \*\* \* Various locking primitive implementations (all except proxy locking):
- \*\* + for Posix Advisory

Locks

- \*\* + for no-op locks
- \*\* + for dot-file locks
- \*\* + for flock() locking
- \*\* + for named semaphore locks (VxWorks only)
- \*\* + for AFP filesystem locks (MacOSX only)
- \*\* \* sqlite3\_file methods not associated with locking.
- \*\* \* Definitions of sqlite3\_io\_methods objects for all locking
- \*\* methods plus "finder" functions for each locking method.
- \*\* \* sqlite3\_vfs method implementations.
- \*\* \* Locking primitives for the proxy uber-locking-method. (MacOSX only)
- \*\* \* Definitions of sqlite3\_vfs objects for all locking methods
- \*\* plus implementations of sqlite3\_os\_init() and sqlite3\_os\_end().

\*/ /\*

\*\* Return a pointer to the "temporary page" buffer held internally

\*\* by the pager. This is a buffer that is big enough to hold the

\*\* entire content of a database page. This buffer is used internally

\*\* during rollback and will be overwritten whenever a rollback

- \*\* occurs. But other modules are free to use it too, as long as
- \*\* no rollbacks are happening.

\*/

#### Found

in path(s):

\* /opt/cola/permits/1460468423\_1667577396.9698634/0/sqlite-amalgamation-3390400-1-zip/sqlite-amalgamation-3390400/sqlite3.c

# 1.13 direct3d 10.0.17763.2989

## **1.13.1 Available under license :**

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/\* zlib.h -- interface of the 'zlib' general purpose compression library version 1.2.13, October 13th, 2022

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https://github.com/aappleby/smhasher/blob/master/src/MurmurHash3.cpp

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https://github.com/intel/isa-l/blob/33a2d9484595c2d6516c920ce39a694c144ddf69/crc/crc32\_ieee\_by4.asm https://github.com/intel/isa-l/blob/33a2d9484595c2d6516c920ce39a694c144ddf69/crc/crc64\_ecma\_norm\_by8.asm

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https://github.com/SixLabors/ImageSharp/blob/f4f689ce67ecbcc35cebddba5aacb603e6d1068a/src/ImageSharp/For mats/Png/Zlib/Crc32.cs

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https://github.com/BurntSushi/aho-corasick

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Aspects of base64 encoding / decoding are based on algorithm described in "Base64 encoding and decoding at almost the speed of a memory

copy", Wojciech Mua and Daniel Lemire. https://arxiv.org/pdf/1910.05109.pdf

License for FormatJS Intl.Segmenter grapheme segmentation algorithm

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Available at

https://github.com/formatjs/formatjs/blob/58d6a7b398d776ca3d2726d72ae1573b65cc3bef/packages/intl-segmenter/LICENSE.md

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<UsingTask TaskName="RegenerateThirdPartyNotices" AssemblyFile="\$(InstallerTasksAssemblyPath)" />

<Target Name="RegenerateThirdPartyNotices" AfterTargets="Build">

<PropertyGroup>

<TpnFile>\$(InstallerProjectRoot)pkg\THIRD-PARTY-NOTICES.TXT</TpnFile> </PropertyGroup>

<!--

Repo configuration. Upstreams, but also more: the TPN in dotnet/runtime serves many repos outside its graph, because dotnet/runtime produces the installer that ends up placing the single TPN file in the dotnet home directory.

-->

<ItemGroup>

```
<TpnRepo Include="dotnet/runtime" />
```

<TpnRepo Include="dotnet/aspnetcore" />

```
<TpnRepo Include="dotnet/installer" />
```

<TpnRepo Include="dotnet/roslyn-analyzers" />

```
<TpnRepo Include="dotnet/templating" />
```

<TpnRepo Include="dotnet/winforms" />

```
<TpnRepo Include="dotnet/wpf" />
```

<!--

Additional repos that should be included but don't have any

third-party-notices files:

dotnet/efcore dotnet/emsdk dotnet/extensions dotnet/icu dotnet/sdk dotnet/windowsdesktop

-->

<TpnRepo Condition="'%(TpnRepo.Branch)' == "" Branch="main" />

<PotentialTpnPath Include="THIRD-PARTY-NOTICES.TXT" /> <PotentialTpnPath Include="THIRD-PARTY-NOTICES.txt" />

<PotentialTpnPath Include="THIRD-PARTY-NOTICES" /> <PotentialTpnPath Include="THIRDPARTYNOTICES.TXT" /> <PotentialTpnPath Include="THIRDPARTYNOTICES.txt" /> </ItemGroup>

<RegenerateThirdPartyNotices TpnFile="\$(TpnFile)" PotentialTpnPaths="@(PotentialTpnPath)" TpnRepos="@(TpnRepo)" />

<Message Text="\$(MSBuildProjectName) -> \$(TpnFile)" Importance="High" /> </Target>

</Project>

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/\* zlib.h -- interface of the 'zlib' general purpose compression library version 1.2.13, October 13th, 2022

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By Sean Eron Anderson seander@cs.stanford.edu

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<Project Sdk="Microsoft.NET.Sdk">

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<!-- Needed for CMakeProjectReference -->

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<ApplicationManifest>App.manifest</ApplicationManifest>

</PropertyGroup>

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<Compile Include="../../ServerContracts/ServerGuids.cs" />

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<CMakeProjectReference Include="../../NativeServer/CMakeLists.txt" />

<ProjectReference Include="\$(TestLibraryProjectPath)" />

</ItemGroup>

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Written by:Philip HazelEmail local part:Philip.HazelEmail domain:gmail.com

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# 1.18 glew 2.1.0

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Mesa 3-D graphics library Version: 7.0

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- \* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-
- jar/bayern/steinbrecher/jzlib/GZIPHeader.java
- \* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-
- jar/bayern/steinbrecher/jzlib/ZOutputStream.java
- \* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-
- jar/bayern/steinbrecher/jzlib/GZIPInputStream.java

\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-

jar/bayern/steinbrecher/jzlib/DeflaterOutputStream.java

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/opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-jar/bayern/steinbrecher/jzlib/JZlib.java

\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-jar/bayern/steinbrecher/jzlib/InfBlocks.java

\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-jar/bayern/steinbrecher/jzlib/InflaterInputStream.java

\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-jar/bayern/steinbrecher/jzlib/GZIPException.java

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\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-jar/bayern/steinbrecher/jzlib/GZIPOutputStream.java

\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-jar/bayern/steinbrecher/jzlib/CRC32.java

\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-jar/bayern/steinbrecher/jzlib/Checksum.java

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\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4jar/bayern/steinbrecher/jzlib/Inflate.java
\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4jar/bayern/steinbrecher/jzlib/ZStream.java
\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4jar/bayern/steinbrecher/jzlib/ZStream.java
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jar/bayern/steinbrecher/jzlib/InfTree.java

\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-

jar/bayern/steinbrecher/jzlib/InfCodes.java

\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-

jar/bayern/steinbrecher/jzlib/ZStreamException.java

\* /opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-

jar/bayern/steinbrecher/jzlib/StaticTree.java

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/opt/cola/permits/1892522327\_1706083831.677597/0/jzlib-1-1-4-sources-4-jar/bayern/steinbrecher/jzlib/Tree.java

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1
QpbuTj !#
5f.=F3$D/l#&Te,w
yz%h '5>d7
$uK
%_substg1.0_100F0102*_substg1.0_10100102*_substg1.0_10110102*_substg1.0_10120102*_substg1.0_10
130102*
__substg1.0_10140102*!__substg1.0_10160102*"__substg1.0_10170102*#6
9-?l; ?jIGa 9KNb. ?AOSEJ#/V S
QK
.D&:xj@k]C#
4 'u%C_substg1.0_10180102*$_substg1.0_10190102*%0_substg1.0_101A0102*&_substg1.0_101B0102*!'
__substg1.0_101C0102*(__substg1.0_101D0102* ") __substg1.0_101E0102** __substg1.0_001A001F*$+ t "2I #Z,
у
/P
6<V~b
,)(
3IPM.NoteLicense URLs and Parent component details for Windows 2019 LTSC
imageEX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23S_substg1.0_0037001F*,_substg1.0_003B0102*#'/_substg1.0_003D001F*_substg1.0_003F01
02*&(2PDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-
AMAKOTHA@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange
Administrative Group
(FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f14858_substg1.0_0040001F*5<_substg1.0_00410102*
%-6_substg1.0_0042001F*9._substg1.0_00430102**,:93feee6a76ad1ba6-amakothaAman Kothari
(amakotha)@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)EX:/O=EXCHANGELABS/OU=EXCHANGE
ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
01F*.0DEX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1_substg1.0_0065001F*E_substg1.0_0070001F*)
9I_substg1.0_00710102*L_substg1.0_0075001F*24M485893FEEE6A76AD1BA6-AMAKOTHALicense URLs
and Parent component details for Windows 2019
LTSC image6G~M{nHEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDL_substg1.0_0076001F*N_substg1.0_0077001F*37R_substg1.0_0078001F*S_substg1.0_
007D001F*68%4$T)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
```

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by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

12:38:28 +0000

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version: 1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

X-MS-Exchange-CrossTenant-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-CrossTenant-AuthAs: Internal

X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:1;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

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 $\_substg1.0\_007F0102*WQ\_substg1.0\_0C190102*5=Y\_substg1.0\_0C1A001F*\.\_substg1.0\_0C1D0102*:<]rod .outlook.com>@B+//o=ExchangeLabs/ou=Exchange$ 

Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f1485893feee6a76ad1ba6amakothaAman Kothari (amakotha)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA\_substg1.0\_0C1E001F\*`\_substg1.0\_0C1F001F\*;?a\_substg1.0\_0C2D0102\*e\_substg1.0\_0C2E01 02\*>@fEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHALX LX

Salil G K

 $(sagk)\_substg1.0\_0E02001F*\_substg1.0\_0E03001F*1Qg"\_substg1.0\_0E04001F*h>\_substg1.0\_0E05001F*B$  Di

Marimuthu Malayandi (mmalayan)InboxLicense URLs and Parent component details for Windows 2019 LTSC image)EUzgbOSIq:(Zi%:(Zi%\_substg1.0\_0E1D001F\*j\_substg1.0\_0E4C0102\*CGm\_substg1.0\_0E4D0102\*n\_substg1.0\_0E4E0102\*FHo\_substg1.0\_0E580102\*p\_substg1.0\_0E590102\*EMq\_substg1.0\_0F030102\*r\_subst g1.0\_1000001F\*JLs:(Zi%:(ZiAG~M{nHHi}

Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

bLZFu\* rcpg1252Chtml11bid0 'ch set0 PVUUQW2U3FYkcu ;B7 134R`cP dL364 \*\9 < x:o="Ipn:hesL-m `so-]m

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```

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R2s`c8RS?h/2K 79nSNjIndp\_K>Glo@l:r>751&55"/-/5<dyGj#@SIN"T#@KX"v{U967D"w3#@%r-

 $w0\&;xk\}\% + |@G1@`#@r+\{![6],pfFg4~85A < zxS@OTH&i;mu;u,5,o^pu@w?5\& < w0&;xk\}\% + |@G1@`#@r+\{![6],pfFg4~85A < zxS@OTH&i;mu;u,5,o^pu@w?5\& < w0&;xk\}\% + |@G1@`#@r+[![6],pfFg4~85A < zxS@OTH&i;mu;u,5,o^pu@w?5\& < w0&;xk\}\% + |@G1@`#@r+[![6],pfFg4~85A < zxS@OTH&i;mu;u,5,o^pu@w?5& < w0&;xk]\% + w0&;xk + w0&$ 

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`ecAdP?wra+&nbT`X'a@/?3

w@!Pp" 'Mo'M??/?Oog\*b'\5 -P/w`Opl/;!Vr-O\_nO\_o@?/?O\_oI@'81RPIw0ry T\_oT? ?//?O !

 $,-\#?O1OO\&'5)*, 0.//?@aS0@Ocx`ppZ`jj1PX!_1P./?OI?JOK_15689:/;?<O=\_>o?@W?BC[`r^Qn'-interval of the second s$ 

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b@xy~/?O?/?OVPqeH@kwg`4py

Fr?GAaF F

`quFH\_ohpks,Awn\_obOc\_doeghWij0/vSg5p/dy"74}<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2P R11MB4793.namprd11.prod.outlook.com>bLTqG009

js

+QWY 13579;=GIKSU]'?"B@Q?\*%)-ACE2[:B/Marimuthu Malayandi

(mmalayan)\_\_substg1.0\_30140102\*\_\_substg1.0\_36770102\*IYJ\_\_substg1.0\_3FFA001F\*<\_\_substg1.0\_3FFB0102\* RT@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-

MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-interval and interval and

AMAKOTHA\_substg1.0\_4022001F\*\_substg1.0\_4023001F\*SW\_substg1.0\_4024001F\*\_substg1.0\_4025001F\* VXEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANAman Kothari (amakotha)Aman Kothari

MMALAYANAman

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*.\_substg1.0_4039001F*[_<\_substg1.0_5D01001F*$\_substg1.0_5D02001F*^`$\_substg1.0_5D07001F*$\_substg1.0_5D08001F*A$\_substg1.0_5D0A001F*$\_substg1.0_5D0B001F*bd$mmalayan@cisco.comamakotha@cisco.commmalayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt\_substg1.0_5D160102*\_substg1.0_5FE5001F*cg,\_substg1.0_65E20102*\_substg1.0_65E30102*fh\_substg1.0_80080048*\_substg1.0_800A$ 

 $001F^*emX\_substg1.0\_800C001F^*h\_substg1.0\_800D001F^*jlY(!eyJJc1VybEJlaW5nU2Nhbm5lZCI6IIIsIIVybFdyaXRIVGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hFZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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"English": 98.21429

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"BestGuessLanguage": "en",

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"@context": "http://schema.org",

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},

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https://3rdpartysource.microsoft.com https://

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Q?

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C=@IDATx|E\_J \$BP. Eb@11

(bA.b]Pl("\*"E,!\~wos;Lh\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@G4GHHHHHHHHHHH,x# @ @A\d" P=@\$@\$@\$@\$@\$@\$@\$@\$@\$@E"py\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@A E) \$@\$@\$@\$@\$@\$@\$@\$@\$PP(H\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@ @ @A\d" P=@\$@\$@\$@\$@\$@\$@\$@\$@\$@E"py\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@A E) \$@\$@\$@\$@\$@\$@\$@\$@\$PP(H\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@ @ @A\d" P=@\$@\$@\$@\$@\$@\$@\$@\$@\$@E"py\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@A E) \$@\$@\$@\$@\$@\$@\$@\$@\$PP(H\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@ @ @A\d" P=@\$@\$@\$@\$@\$@\$@\$@\$@\$@E"py\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@A E) \$@\$@\$@\$@\$@\$@\$@\$@\$PP(H\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@ @ @A\d" P=@\$@\$@\$@\$@\$@\$@\$@\$@\$@E"py\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@A E) \$@\$@\$@\$@\$@\$@\$@\$@\$PP(H\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@ @ @A\d" P=@\$@\$@\$@\$@\$@\$@\$@\$@\$@E"py\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@A E) (!xRdH:(eJ=/szWCK%d2WVF@fdA#n,Z(\$@\$@\$@\$@\$@\$@\$@Ab Y;%k)eIdre)Q>Ed}[t\l<<%%\$!\$ 51C'kV8BB|rYlSV\*Uce dddg<()))n`<;HHHHHH R"`e%s{zqy@B!%NC}{uMFJ DI(]I\*IJ\~ay^yiv/0hwZ> \*Upw3i'|2P4gywe0 (VX!#GV@7n, |tM6l2w^}U[cK @4;, yq`Z\rPq+?N;V~:`6gYvlR[Ct2RLTTI=O\*&[0^'\szJ\_^RSSLpA,GP 5kHZZ`eR!Wm?\'(FO>n\$ge}U\$@\$@\$@\$@\$@\$%/+3a2b@M1p 25Ry2C\*.wv<%K\*C8Mq?qi\_m%3gK.|zp8-\P+`\_zzRh\$pc<C]\_SN}alG\*2Wp}7#id2d{~D0 ~qiRc gCI\$@\$@\$Pd PdI@zRJiSX/b<}Qrecb~AmV w}'|\$&&F]6B&X{=>jVyff<wb)R8Y@LSFMrI \$V1kWYjRmyV @\$vU otDS& &@A /G\$f#-[~AHUVb@8 pKMeA\tE0C4( 0saVZ\$E/"Vw'F V a.|aJ> w^'5,-K+?!\$.[2Js!.1CG)\_:sh/7\;G pQ<O8 mV+?}W 4TRW{

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$Gp=;G]^
| yb@-K.k
g}&H=b#%`U@(1<jsN+0adYtqH6yA:(GNp%{E|!K
e<Cg! @9N?jw"# "
QH
.=h
```

hFyL+10?c

6aT|ytNG<;D;8+YgTuSJe%2yRfMg11 #/6U=z3@"F=x)IvDupTz)Ws@T1 lm(d# \*FR.K\$#p'Ju4K WOH  $Y6\z(\% RSSN \{!dOE'\{e\}FX~Z\$)$ 0obJ2\$"^x i#On:g4b9 3e`!eG# (|(k @8\Y vZmB?{Gpm(Jt@hr32j Q+T O+A<^U6a=8(p[2> \*1 KPF\$@\$PP(\%0091KLpi~x;M;4\*aAFFu?`v8-\*HkOfiw~Dfj#WAWWa3 ~oA0 7 +cP[79U-,# Hyfqc9Oc-k!i O#3//f]3[o@p kUF\$@\$P0@^-;wl82 #pzg+f]wu#-sU2|p{L}>s4igbc.6FoV(H}Z |^50[:/\_.[n 4cGu!6jI\_MN;SC[v}GH[of|S7f3\hktG^Hol4  $L[R"?^=Q\#>S B?U = \{ov9c\}x!pU\&>bD\} \{Vs\{\sim \sin b, Sigaq; SU[onw+Bgh5Klew\}$ k[gxSXGS \$XqY+X+pOo{(3lp^+)Ns~:`OdPs5Sz iJ-J4\5s!)WL<wi[<v9{eIJwV  $p@X\,5mu{m0tdgI~}nO-T$ :4S7;rq )&L4p6J^>k{14 !)f @HB p&93N;MwjGH/D@s1 ~2}8B|vO fFb3fbh)3#/\$of]{2\#G/,+Wt|A n=4h P:{ 1\$EQA uoN<x{O>1k8xp?\pVS8RR7vZ=AxpuwW^ipx2Ew 8Vu!#!; Kxmu=y 11cX/#<b}L;cg?<w9U\_?8#/GDTS~gy~<7xi+N\$ z qd"^h})6O?qy%[N4Bx;e\{+K5/-C! rcrd=r3[ \*,? r(6?O2KU D&Y/;(8FVx\i9u>m!1YtAv (f}7G6mnt@F0: ]p, F \_-W% JxQ=q7 ERJ:'w[BGNcQlmscZ`Cq,3%J50#!8aq6]?X9U]7sc0-V22846,pO>p^P}K]qM-wCkBG{NpW<p1S}xFxV /;!]v198wa5]`sgL+LX`J.y5?>CTuq^fm:6diVxt)1='e;a\$>.-NIMoi:4{yzsW`mR3}y+fd8 Y-I99/ @s3?Xu@mZJ)&e\$b%F>`z dWm\CIHBI\$@G9M<L)YdP;\_~O=&g;V 'T%gU(c u+,<3N}19>>>^!0LNVWm~fw1cO\$Vh{@lsl:CHN8 9evfO<9!ALef9+KXuBn{O\$|~GwgCa)SBB/Vff s} Xn !L\_|>za1#tmvi}ei,?OO4\*2sHf[<{&~AVJJZj~>Emer/.P\,eR^N.--UhM\q@=eHH)%7]\Nl>W]v-+WUkUon]K\*QnAG!XYRVU! ekyeWZN\$@\$) q\$@1GPpf`E\*Vh9MNjUSH70U~[3u28W!7frh35(q38B! 01^8X0 Q59Qw//}hr !ft#B<Pe~Fm0!`p{-ZQPbt/ z8?iL?[15sG )B';p~LI>fsl ,>!jVL@i}-vfo8h%nTVl?ff\$xMv[)IeeG 58}k3QV,9bBT./mU+[e]b\Y9h\UJuZ k+#bZ}ZA]7@X\_T]YF5\_FUDMFSh\B67;h, "H@<e8R fF|.G' nV'fRA2Gv\*y  $\langle Z, \rangle$ ;8{B 803B;!At\ \$ERZ@H8Bm>6;N<DkP|ya %V-`Yge}Fh N>3M3QcB;x|60K@T"yj9(HgH`MC\>38/f#b%O^VxXw  $\sim N[q\{pGOk]G=^Lb+nA@pC^_tEo,7mBxM$/(+c4Wwm <{HH})$ 7D%S.x@mN;1Nns;72"jjxe{5CPZyc 6UaAa4=fsbJUbYau\_Jdl<P0OZ[>a\_WHIQLk:Hpss}k5\F~8pT G{W!4dBem+jeOv5uI tHH7zihNz]Z\$c%;YL\$t&C\_y,fE<e8LL=LG`}3"af1N.9"#]7Q8 \$D\$XE:Id:A%\$\$X!n=?~|3zh+W>`@(pu;s"3U/D@^?UW][P\?>.w\$eX98z {]w<oP0s{NCosam=X &A->/A --MwH1K]@lNj=seH3sgk/~=uP+\!oGdcg3YPcJ-#A`  $r \sim +8MJ \sim LzLnQK(\&G)qYRrFp7u|nI)_{F}!Xr\%; R`Oh\%6Vz97MDDWZ < SEkqR!uT$ Ww\_UOj%Z]symB@jcb9D=RZ5[.yLOVA- $UI[+mmSx^{}]$,8D+e]\r9\&imH+Yn\1IN8O8IVVgrI\fn\33~Uk/HfdWG0[Sd1]\?y0g[kPe{dsz\Tuk'0~sg?n/mIH1}]$ 

```
m5ZTZYn.j0vy'G9dvwg#!M&Tt>LFA$@'@A @>(hDYpA8
'[z8ViY:+(AO7$N81[W7 pL1M2W._~ 3CH0k,6?`?p
u;(1::&A?:N0 < NTv08B3 Z fbQ {rcpl, f[1.B-a_{+}X8 ]
m{YafB:uRNep8O8QJ0vCj@A>o=;{k[ogA(G'ncRD={Q
c]yOd?v@e)mg<6+/O vN>OmEGdQwjS7q4*fxq{fjNuvfm{U{<Kc;
rUik6E
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f{9::-"vg,*lSwZIM[3e*=2Wt:,&8fy{kz8(pf/^?snRpt
lEvdGw=E]ZN:GhLJ]x6%hEn379loY]^E*$O gZ5/mA$Xk%dn]]*eY^Ju7[RJ oy3]wH$@%`r;WD
p~eLJ$<.tr7bga1cb}f"?3D]-A1BN&S8!mQ:?6mj(,]SX +C8Uy5nX0Woz*
8uvGAtr!$N^r'n6_bSM pVg}|uy0}$'
at!v3MwAXA>C/V!YVto_`.30~v="fw81+JqtY+&8U=je+P-J@u
+jEd8Gdm'K^X
kt[n3c%?2T\5ygEISv$CF|vJTy,1 Udz
2ix<Dp05"1s:e#nuAu"^$cWwL=J2,c#8dVKJG{+
VV"&~S)QsTd=jUjTKlM{a{HcV9#mwj}~&9SQ"6R*$[mVvU7m,ANWrJ[[wSh$@$@'@A
 @0 ec.A.N0% leK% Mh)N339DGx7f;0
`=<vPVOh
dLc)Wz
bqrtmDBb#g.lW87#Mum`6iu[gp_cwgU:9>7 fzx\}a!VXc5@63,/e3?^Pu~5 [1 I;Fw+73&9O2
fxl3d91s//;em,Usq_I.Vaf^]XcF6BU!WV:$C_W9-vYZjH`Y>gv[,;P^h(^]Y
S^Vip0olZS5NZ=h^\mY!L`tF8+dP=lB^ Y'DU$?(U*cjKPJ1tOd^0>R*T J&{Ko 6eNY
,~J?] }.9hyywfla+~ Y2[%+a=+|E, @_$@$s0+s7o uLBSqX>}EcvYIKutep*8ap}X[
<#]x?o91i?)Mp{_47dRGwD|OwZZSR~Vpd+k,hsvdRu?;Qggspm.BlUa_V>\}YbvJAE-n+&uCeZ"~o8[Zu8o2,-
|Ib|DV(PFN9v)
2EgCV7imPK?\fJ)r\1UUv|' @d# @~so .D6.49mkWw8^MfjuRi48Lua!Uq:'?#tur'# ;uA0=CVgeM[oY 1k1p
!p>];F:[p8eBLE= Jf@Yf]
yh3ZwDX;y<8qcJrd8.#4C;`Z Nvx5B48YB
EV6Yq9Zq ep[5.mt7>*d=6*Q<Zg_&k[]B/y,rC,tdpF!lW;Wpm8.K.0dpaJt
t#WY3s~ 2rL:E
5hD:X^yrgK2Y~m 0 dU
V' X&*p>:AUO'7|c%16
8p$-^1j3+VHXA:-g]Cq,t=@G
:axUP3V "'/XXq#nnPXmk9:s
}`NKrw(ae.=3AV3C{6B}6q2bL
;%D;qA+6'X)HK9;.#U8oPa.?=kd,V;>!o:%^X%Hpc9Xw_05J,I@[7 uAYu
uj r[Cr#ZR 8g4/#enae~o.5s
VaSLrFZy08[sJI?mn^urtwTZWCa@?@'p'(LwCqy7HCB-8k%5k?Q)x9"uK%96T7O*UX/Nip/P
^fd]<.(VcP/j81JO]'TWA s|HFQBgnqqC''*OnkpW|g^qqLUP7@2y<W9#*J,?V7d_Yd_UV;
$rIS"eiZyi;JJOoGr:J$cU)_^C$[f Xp ;Wx }Ug%?2^
8qzrRSJ7sq@ol.S*$@$@PH
SN9E;Z8 yn6I@p<gwH"{&_X#W3x=p (B8($-;g|e$dB Hfln5 %$$${a>o=BB /-/IZm.~*aCc>|110*8rtu_
u()|*)fV,dg^&;UW\%z9umEzD''L<\FUpuzvcliX''*e(Tb\;zv\_wuUF>L:kvstrqg79*;FzahvGSIir5h+P6gH;\\[YG-\7W]
^JCCoQ$r{pWybdjQjeEK4m@psH1TI,vmzA)[Qp6 A ~q1xV% J*Iztyt+.0i
?Z`c)A^iiiDooowxGJAPp@9#
```

B}}i;a{pc5/#XK/lQA(Es!E H#fY<qNZ@p mL\*Z@o-X Q"wkYaR:B[GZUJY\*v|I99`GX45;M`\*`y9 #5\*Wp]"\_<]ULc)mq!C ?9FAK^=>U%Kt//1WF}Xt5i+Wt~6 @r>8UIH ,~ m2\$8\*8lxX \$cx&aigiVmjjRt TWv#>sf6AiYMG.=.\$B~7C\$ L]vVp)))sYIM}O2E6G G-`\_!|}gTnZB2l!Q+xomN<Z|'C^\*\_'}\*/]PafYNisvY+'uW!6|Yva]S u#i03;RfztyAGKNKSx"v}XBf[P/XruY=g?jWU7/3PR.1QK | @xwk @L=@IDAT^fNHep06kL~ ;d\*iIGp~vyZ?0+QFr+>83 XY8.SN2vX|K,\*4`@!CX/\$qE\z8MA@\z WPpmG+rDb>c\<wku Vt+a5[1hG`y'|AW`RxhB>?xq{=Vw[^1X4HUcnCx5B'haDNA19guo <XN:va<.boUcg6h{eaLis\,!y{d;KrmLyKyIh}\~~\_n,g|N!LI'eRikv5LPB21;?'\*HnmVwj~ i[]VU+/U}? g/6MH Y]&VVI/M'kC^%Uy;=6p]>kbM]k-8U6n,;w(7\=0h-2i@3'4 P (L/^,pzOquUVYdppk% B PH9nsAnAi\$=4+0h>1D\$SFhP\_pOuST) !9{]y|,o#l[x!:A0J&17ZG;Va<+r"5z;w+P)AQuo&GRQa`i6d%\*x:1ty\xU\$CT.M;w#fy n +'2tm3Jifx>N\_s\$yt] 7>IgyiJx< K? \*D!+2v|t6ER: [O/{d) 7\: 5+#Kf1mSQ,VlQ!f--|%D4:RoAHpy9VYtx:EK!'dVTBnh "[H`u=mMqr%YUROh6d KR9HH"#@A 2n<H 'Mr~:G>`6% 2ipd"Lna,C<;hpye-[466%KUYz\_~ep Rj a" T lEr~D| ^wy|G!D8rkHZY rSHw}goqpB !s(Z`wBuj +^ziZ)YEA +r"]|"&%{i~C[~(:\SAn}zsAtQp"INVY\*pBCKfTc\*Qp//M1#?z]qXOT'gHA9|)<R@ ?NM?KJ{6HJFK"`TQBV.XU\_Yc5(n;9=3xS?Hw<PR v`S \$'6\_vyGEVZMWF~yV~ f[I1[!cO~&D.'?xOS5+@mZ I[y2 rsm iC# #f/uA]IuO# 6g2!LH^D6x^xn8RC)t>t(9cP{Wt M} `FI/]h8d `rC9yR"y]ko-[6L@hAKr`\$}v:EZ!L/o]}w1R/bb\_8N:C c0 YwJ5sO;3UN|J '{=r>aV urSs %`8\*\ W,mHJ sJH K[CR\$5 ^7U5oIJ\*u=]VJZl1:YnXN/NJYbUc~]{\*Kqd)&y'6fOJY5ZLd[KciU.5dhmbj9%]{ujWKH\$ d?a XL\$@{mBlx!E#Lj\_lg9=+!Q,oF? O8Q[XKTX&CP}o/v.s"<:Pu~J+ O\$.B"EmGyT?6p{uB=9-[9I'L`#i|=Fa"W~Dkva;/A Dm1\*AWZ^bLS9Vm!Xw \$zq1VIeG'q!|BNIaNOww%V(H]%`z(S&Z/M@d@H!+SxzzxxuBmyPUGE@r`Tp|cv=\$0 %CZ`n7>b|@\$\_t}zxS \*]j^91ElU9BLu3g |fQW>rwhZqn,kv|C8!TU F\$@\$?i @Agv~(<f:}S1{4{\$s>|xP,wn[nq~O9 :3wE> eX503?/gQ]}\nWX2E39@?+<y6}>\$Eo[za! `u]q\_Du{: A0 J\wubokXW/i2q]aLg!\*+|}eb9^{b^+hv["8,Y9Qk8y/-@}FSH4<^bG2~`&~b{,|.u~kns|RJ9D)-[e;F ^xyv~\_\*;\rCd7j1x+K;]%sC[GUB1 +& p /pG\$@\$e]Z-/ euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh  $A@6`[yP|Bx*Yt=<Mp@='oUL.+w}*~d*y]g+E#*\y+Q#^vk7l_~=G[6c'?]$ 5~uE 8CYQn,qn3g]tfb}cQP;^,\_=c e81LcL+g;;?j1<m<8 L)+Lz{Gsj23>Z; $[qmXyYBe{\$@E}gY1rCOy^ m7_SPdMD\# =\%coH D@($ z ygAakyK7Lh;X:\$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe \$paUzy 78?~>XkWc0`&n'\_Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6)\_\_)VqK\$A

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pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:${X#(0#THK^ gs\gF|7*NvM$@$;\!;~<H
r.ZUpUT;vt9Zb!19PGA3^~C>14>*3fp.Ua:z)>jNf
fu~
Gu%u(+`bZ 8%`\:"q|%T/13g"S
,An?+G?c
URx<o;wn9XPNi]jwK:D4s:U:w5-7]wXH1yRhcKk{(WJ.9j&y:bd %Jh6fC~goHq'f#|n
v8v + b5jlO>z /
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cimc=T8PZ{U+
Υ/
0%uKG-*#F' w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg
mf' ||wY,v| < ap3B@ASZ?!
! ~?
#8VBX@[B`O?<
33u'|_yQ#86"_ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
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cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$p(S"
   ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$PP('
   ?(:$@$@$@$@$@$@$@$@$@$PP('
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?(:$@$@$@$@$@$@$@$@$PP(';wD:tbICn
  M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH\$@\$@\$@\$@\$@\$@\$@\$@UXH\{[NrI9CjQq\$@\$@\$@\$@\$@\$@\$@\$P8 P(\&c+W\#Fq/l>oF-[f0]) = C_{c}^{1} + C
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^_mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/}z+VVO>4lN>d0`3>
@W7xCpp<\=4kQ:ukg|RuSSSs~Z K/MGRF
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9j*)VX:>-(*
0bC
mqF]l?2i$;w.>SO=%wqGP9
&w)9%4AmKN?t3gN>.7xcSN(vD/\~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+_`8
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6>8
usx-,#
               "P HHL|{W_}t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
```

```
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fIY3fnu
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!L=Z h([t5>a7 `@_,X UFXmip
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8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiYjF8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
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   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K_|0IHHHHHH,h*
GVeRm$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r
xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK_A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
T[.?x# r
O~" @!3JN2U%r {AeS3d
[lq
j%*$/un^[|r-x:)0#g@B,z3zjor091;
y|0D0(C=$2x%p`<`T1M; rB6g11# bXz={CrO$@$@$@$@$@$@;g
H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(_[n':Q5IA0*_fS0nV#NCY_+WsNK]Haa9
8 p~ 1BH
fxC:F8(6b_lLizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku_aqeJfcpA8?$uM[NsZZPFNe!f&X
83
GcX&{`($@$@$@$@$@$@$@
#Jg1q W%\$
@;J?f#W7aW"QF^BP9@R^sa &*`yg$0@[o0C-?)k_
g hmf8mBL|E(F [0]00v
V~!zCNc06
HQ)$@$@$@$@$@$@$@'Ag3IF24a6N
YSP1e?K(IM"o)0YFw
Iux^'XaM4I0b&*6e^2fGz6Ei=5=aLD^F0[$ aj^!F|LX6I|a1!*<yqtE9g,$@$@$@$@$@$@$@$@A F,A$pu/
N(Z>}b)[Kie]pB8::ZL|??6l mu'1 ,hB4i>xky
uky/Em{O>qk}unAofb8BM`2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq
\%8w@A
E5P_veyk3gbC}-P>kD/oO?
o<LG<G!}7n[;#>@71"
x?(-3\&B8YF wsX9-(olkfU[ZEt'8"dh0 L F={o}])
GKMkf<c360|;1
,kN{=]$6^^uNh1bf$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC
I/b#?F
wU0b}5E|rCa`FA}R|fFmV?G87|WP%Bh4PZ$p`dgB8%/Xg"O?TI}Fbf$xA1a@"n;/G{.>^p~E~WO$EhzJ?HCNII6=
dnrHHHHHHB JLr~EV<sup>(W_s='&y.$/7,[%,<r<3^5aDJ*>=+JW_}Utn7U0+PC-S7!T0]]?yRS%-~0G(PWp>QXZJ</sup>
}q0:!)`5>mm&Sq!00b]HfPHHHHHHH|P5.RIrf2N-z{Ix
w;=3Ycd$rY6B*IhQZQj/@<x(0sN9pG%Q>:wFFitE~o[6<x7#:!%!{xpi}a(@H+Dl`6I]"R
  `+rHH$jQ
w|Axke!<O[*@%|41P)IA|
#0SY4m)fX?
             TH4T" s?aHHHHHHHQcPJp8)BPY]"$ { @ $aUjDdf`ORHT
JXDI$@$@$@$@$@$@$P1 A @)jL %)I9zU0TDb$
{\`!aun*^}J}$<Th($@$@$@$@$@$@$@$@KTB #gJ*Oc@Pd!l@@v,>uJA%-
```

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J2dgHLW3'0Ac@@:vd.)X;+SN0
  0J `ZHHHHHHHHHHHL8IW(
   @IA^
  (Gh(G7]!
"@@Ie$@$@$@$@$@$@$@$@$PPnB$@$@$@$@$@$@$@$@$@$@%E *}V$+}`R~quYZ:
{"A>m`$@$@$@$@$@$@$@$@$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII *I@
                                      (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4
`oPC}zMOV%P "M6I
  7@q({OCYrPRN P\t
3GpNb9!0Ac@v2g8a*}!&g+*^SAY0
   @Y`IHHHHHHHHH
PJ
             %>&
                             R"@@)f3$@$@$@$@$@$@Ft*@IDAT$@$@$@$@$Ph(KIHHHHHHHHHHHH
                             (%4h6C$@$@$@$@$@$@$@$@$@eIIHHHHHHHHHH
  %>&
         @YA.m
R"@@)f3$@$@$@$@$@$@$@$@$@$Ph(KIHHHHHHHHHH
                             (%4h6C$@$@$@$@$@$@$@$@$@eI,g$@$@$PK]2%"4PMHHHHHH
         @YA.m
Dba (j%z"&3S{+eGOC7~=e`#%~*[
tI:uJU N
-LR/
w7Q @&@@?F!?SJ;+M}'ZS$wL.Y7]'OI ;CF.?fhUk{+%&Kzk(A2%HF- XUke_ri##I4S~]/Z<% "<gy,0}\Yr8yR
                 @YA'(29t[N{;?P)J[65-[)}2<x_~Zk_$dKRbS
ThYoM*
NW*Kt'Ks0w3xI:%++;_`gITYnfM)zs
:"}9y2{whLf,ZV O@o7x%5A! D
Vk!@*Udn
PZ;vL60,|[>\#=[r+VwY]g_]|(ZtlJc/P[-ChR?XFXPb0>\{+l
pIt_s !NVTZj?s.3= O#^qNWS~T#
{ymJN6MCaoC!Ct;k/gb6*2'B)6lR)+jdtV({Az(c\-fz>j=TuBNU0Eamq\?[fI^iK {b}
(vkvyo!}^8qhROC2n8aJ?Oy,]&vVP2@_SdTT<jvl.NVWE.0W<Ki8H$}$k"^K*+CUVnKOgU[2=hV/Dz 7TkReOo-
U~ |ie^^;%SJ'RN"#&uV~^"|J2-3NPMw:*'%bHy$t)okG+YsUrkdr Mur|"[d2;/:^/M;du{!9|$A*U
hy};+dX,P?:H7z-jzB?W(s/+WukWV?F*hs@KqZUuN.^ia{OY%9?fS_y569f#@?v
v(u.YllO$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<*tRSrMg!>>rAVr'JyYYd1IW
Vu{IF3~Ucx}z^MY>@>gc7>6Z-R}LoP!/Hc[v{]\&
   (^4/OF$P \RR.]>+ygedYzo6^BxRhuRJ$~F'EP-*HzC2"SiiI2WQdRJJUINa1
\{8^g Hv \mid O=6\} > sT2Z1 | j XjS'db2*Gjl > sTy(Yk4e > 1)
]m#*U*>Z(N<~BQ.:7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS
Jip;x||a~Q,2U%vra7G!2<~qj^vv{([}Q_ks\&uxhlC>W>XKF
96\[2QrrlSV,wHPpeA}@B?^,_Q9K)+]VA@pNxR^~c}q(w?Ir+_r/~"*'N&)U]p~Uca9Q}|<{29[ezcpBavYKz
k6I+7HHHHHt8UJaB$@I`;&:
u7EIFd2ydGHa89,$@v
90 I&<W_y2<H:PbL3wy3<xC^D+U
KPRne[q.c@!rMJrX)Q\&rkGk(/mN6\]m"K6iEk/]y\v5B=^6Q>2.rR P:U LQv*2#uyX<)cv)n2`Dq5[d5aTdu4k8PM]zt
OSf;<C+H7o-S%womh\[yVJe`Xn12ro2kB"5cVa]},YF)<,vntU+'
\q@_i.SUy[?ic}7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2
_PQ^v
9<>@aV<0M;mh\&|Iy@A^2/YN-J{\9^@_dVYU60%-5:eO)!Q
~xwppW-8Gclv)j,]AXOWwnfnx&~6W[u5&0aU\nmVw:24L!j%wVgcGLfOVD$]~}gW0cwiJArbYD|-IHHHH
5
xw=ZOHHiBV; 6n6ydui&iGNoKq2O \end{eq:chi} c_{SjeI_;f]zss7'' > RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}} c_{SjeI_;f]zss7'' > RddCQ[[cM9:(c{H%eTS!Z=_.{fH}} c_{SjeI_;f]zss7'' > RddCQ[[cM9:(c{H%eTS!Z=..{fH}} c_{SjeI_;f]zss7'' > RddCQ[[cM9:(c{H%eTS!} c_{SjeI_;f]zss7'' > RddCQ[[cM9:(c{H%{K}} c_{SjeI_;f]zss7'' > RddCQ[[cM9:(c{H%{K}} c_{SjeI_;f]zss7'' > RddCQ[[cM9:(c{H%{K}} c_{SjeI_;f]zss7'' > RddCQ
U]#of.:#Os_|BvxKIr AxKPWF
```

>)`\$.\*PQ2:DWHzNJ0{R\_FiD.urRFvHduS5|E/

`6e.O^=:qk

<PFV@ :f8wfe]2zfP6??0b P O3@WN>\*t(&(\*=wT<`s]C!wa:rZyV3<B3=pPe(mBySn`\*\$YRB7?N|:U?Z^~c=05\*r~SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k djNE<zJ0`F [Uiy < & a8OuXV`nz]0.,||3CD >\*J\$@\$@\$@\$@\$P\%' p=zSjc ,\$F0K\*;v:tPTXv+I.J \$&0g( oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc]#fkXblm1PGU YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]Q GdHE}PZ#Od`uG((!69u<ho7Q8(wi`'/\_U(m'{Wu-Ve})V)9rb! v+`A{o!k\*OPDG|>z}S Ka\$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 \$8p+I7o x<h df`<xl(]AjdWra oI&<Oe73ty#Oh61oR3-GHWx0?.E9tk6{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m&\$x\*b0;x{Ktg#k==\$8G)3i1u(e)B9Iznxi':.\$FtlcV,r~ y? ^v 9mt(b&/ga5tP{'i{w)O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj\*rq=;:PKzOf m<ru9)GxB\$@\$@\$@\$P^nlH@(^Z &~-[T|nvYtiA&W\!y9=\*/=BtR'6cUum5TXc\%fwy(\_7WJGaWVeLye @3.v#\_[Y=r12zU-F7mUV\_bctRD\* G]1Mx#ERnT,YV.tJ~XKjj+Qy'ty(dTnr;zY'N&f7}wc \0 [])(f;:f2UU7r?XR1\_VCn'Td\*xOxB1~%0OGcDRd< 8\$16-O8gx~I]NaHLC!  $(76B \ @\ WO \ gIT \ y_h \ 1y9z \ VrX \ H\& \ Py \ Mae RCbTd = \ 1|ILIi0wzA2xyC\ WT1, I]o = S \ SG] \ LrC_swX6]^Sp]'O \ varX \ VarX \ SS(M) \$ R=Uo@?Bv^qQ+eam'WWRrsH]RMyD8G'<Bv:% P527GsdP>>K\_wg?T.f\8!"V5/oUr>oF%a6#-0QY! !@@pf+\$@jE(>>^>} d>9q D&07] iQy\$X>co S}x2xX\f<}[5yri2{Y>MdyaduB Wb8BU2y 6}(/KhfSRb,?Nz/'v)#r!f?bF&ic8tl2uz}A\$OX9&wIjg(0@6nYP"c@joFVLJ.%wqr\*jA#[d5Vm{+7/&O4SI{ ~O'\$5(SS,Vrs~Y3 #@@fK\$@@tt6\$'{z(!lk7C\_"eA\;2d2!\_3CX-k>/qA`s{g\*sscZ} +#o&/g!L(3JMW=19y5 b4ytW0rkB`ZN<)P?\$[>tnQ\*-S]';R#BB/1U f dYHN s;De-DFFHrrXg/Si ]x.U((#fB 1hVc&?K3o6SSF BV Px0eh/e{wy5B\$@\$@\$@\$@\$Pz)=lH [u/Zv%4win dYHQUrKRdnNt\_.=n-SE~<16Q{u\M;3Mf.s \*HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+". :mP!b[zDLUgerJ\$ddV ? s.Q5u@eG s@>Z&<-<qjo Yvni> '@@#f\$@O>B3 t[r.o^{MRRRT\r58/FXZi5cV'%gWs\><E~]\*B^#W+G;flwPA#"W&Ip,2 r\{+)/ ~A9pLyqj>\/.S/y3q5\*\_A=BuZy- $BlR!OdEnfNm < :: 5kBcfcf5O+ji?4J9 < \{ -Bv'u\&R ] o?wS, [[UcV*oW/Eq0] < RFec/d$U(-b) = 0.5 \ e^{-1} + 10.5 \ e$ \$k0D%\$9JA;k6ly%u]\KWvy2Y`\*w<O9+;;{& (a40`VO\$Pzue)rUWo;sg5j!l\$ $nSC + = "fJ(Q(@).hXIR39I>Nn)#c0_H < SOKr?[pCQQN^{{}f*T}Dx^{(2_ts]c2kKjvP@BUc1{?L&}#GS{g}})$ '5 Mid8M~Zu/s  $P|W,g{ch/dJ}$ 7s`.w^I4]CT I]{yK}>\_z3e0', $[AA,/UkISgt\eTnXK _#v@y]$ c|)U[]]"]7ca]^Ei]f9cRop\_g1`Kho{Ms'%)#{#\$[#!O}Nq}Y8q[5016one<6PyC>{mR 0~!V)\$@\$@\$@\$@H WQ) ( IIIysUwQKSl=K/k[ozX\RYS C@B!o|\$o+zm?Q9C.&SQ\_>i@U.(S~Y\*I k,9BTw\$+c{2'pxGWc0V3^?Zw\'iO` #o{-Y38\* t%X@8iV\_oyQ1T1?j \*\_MY\*W3}m5F.epko?V<(|\_MG <g^?a\_('xD%gSeN\_|/)j @ U%iSXVMd:\_{}+mxxQmCem R%q1n@ 8lSo~mwx+NEs8)Bgco8~2n7W:|t4egz8ecM\$@\$@\$@\$P

Ζ

b\$@\$P\M62p@8q,[L4iz(On]&>>^.rrw

([P/BJy8k9g>aJ]X/g&jlTa`[Dd%rR"/pb3oa&\_.0L6c+?q[5I\(,>J^\*n9Co^<7G)HK+cFINm1n\*c;EE)/l-jF  $A(|\sim vu*cP^9T\%X < dW B4JtkY(L|n{iwR}xky;zi7Jz 8h@=B.$ 

+=

h:J+^\$>yc

fqo^n:@Toc V5"iw}Pwp{ymlm<a0S\*3bFU.pwB{vmuy]F~V1[<;Lui;/h>P=!x0VhM R <~\n{%SYtYy(]v\$dHilU@ X[\*U^P-\$;9mf\$"\$z{ uVUfg3K]ZF-ovlu8S+{dD3\$\yU

J#\_PO+C<DK d,jE]U"SHAgK5`

7\_uq8b^2\_})hRBp@\_5Pr8yR++GBfs.PBrT]gjvDB!4U37?c#820j`?z2\${T5DWSIV5eH8cU!asaD1xe2-

X.=fxFNT1]6! (\*\*\*AO\$P9rDNkJ}cvI]

uhR>U))^AiPR

aPWn^n@\_#.PU@qY/Sa3^

G''

#.)\GI~VSmOiHIZ)O7Jn;w5)3O,C\$@\$@\$@\$P04K -[={;RdtX>l,0vH\87GCK`HC hK Tp,W3WO(TV\'80:-?JN[Z

zj-r&

)\$HHHH\*\* #d-

&v{+\$@\$@\$P

ru3a)k>\_32

M\$@\$@\$@\$Ph(]lHh:tH4h wu<?ujKU}(WIId!SN\F4oPjz~U @!@@>}z\*\$pGGB\$P1 ZO"^ !hV\$ hWF\$@\$@\$@\$@\$@\$@\$@\$@n4QpHHHHHHHHH\*.\*

K{oye\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@WHHHHHHHHHHA[^ F n\!

hWF\$@\$@\$@\$@\$@\$@\$@\$@\$@n4QpHHHHHHHHH\*.\*

n\! K{oye\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@WHHHHHHHHHHA[^ F hWF\$@\$@\$@\$@\$@\$@\$@\$@n4QpHHHHHHHHH\*.\*

K{oye\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@WHHHHHHHHHHA[^ F n\!

hWF\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@hQpHHHHHHHHHHHH+.{i2 o9"[1\*UHfrEO:%6m].66w TN8W+! g?WJ\$@% @hecGQ\|r[o:\$CHS

QrY}P\UyI}ofi\$sxy')~^ILL}^e=%)Gg0\*\*SrIIIv\oY\ol

]5@%0m4Yf?#|[J^dCBB\$..Nbbb<0^\*'Ov|\_0.Qu?2]b][gyg\_?\_+-FJi3g\~RzuLzIZ\_|Q0Rtx\_?^

,:o)Eo5sfxvq\kaEp x#Ap? @'\*.t?}x1cd `{O ;CJV<?\_]+h?C>wVSUZUM['f^x~(2L\$B-`lb&8

```
w)) R`P>cF7||gI?j\#AoS3zjyG?J.<:>iq22'Q*T\%|'5*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}U.w+2.5*3SHY! T4T[!_\B{x}]^2xz|ppkyfZCe@AAA2a:u}U.w+2.5*3SHY! T4T[!_\{A}XZ|ppkyfZCe@AAA2a:u}U.w+2.5*3SHY! T4T[!_\{A}XZ|ppkyfZCe@AAA2a:u]U.w+2.5*
```

vcq`riC~JIqxW0kXk|w=zykZ7ow7f !d1m>H~m,4H/\_gA`:+'`P-5W0!\_|EWL\$@\$@A\_R,G\$P

M>}e6anq<DxC\*2pBDg6uy7

> \Gamma wurk

O?y1cA`

rI]^OIr7"%\_]n3@\_H- $\land$ q{w{<ep2QFi?i:

```
f.mQwbbw>dwB7>3M @!Xq.WB$@OWJ*,#<M]"SIHIr6zFYz[nzBOvo7scA8,q^~GQ3uO^`4nV}at8?)=37dY!WA
u71ojKk{f_Ef,,JpnQEis[ogYl_(Hq|o`Y_vqs(\Z mQHHH|&@|y$@^ ;VFDDHuXDbQ$Elk)P#Dx:\
```

```
B\wqr^W_P!6>GeJqXHk:$r:mI|A#Pw-b7mTnUN8!Fy>32VZe&$f_`\Y_~}?0c-
```

```
,,L}Fh#_E`WZ5=aqN8sNa=w<";w:kWAl~'u{NFA0LO?/w!/5k&p,xb=ICCC(=cSGs7FkFy'U|bc\{%@IDAT
```

WRE\_0>-+~%Ku:uQdB0\_bf9}gf2V)7'(b6

```
xQ9an&Abf91V-?~ mcD$L>=
```

Ba!.;d76o>

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Open Source Used In AppDynamics\_Cloud\_Analytics\_Agent Analytics Agent 25.1.0 Windows 2019 Release 355

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 $l\&=lD\#o?['mn3_b~Y''L:W:^=~u\#h\7q\'yuOoG>2|1L~N)?5\&^WMda_D\&?n^`nL^j''a8/~$ 

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 $@NHZm|i(\%Ma3R7\#[O]p[$=Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oa%s]nVYF}]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oa%s]nVYF}]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVYF}]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0$ 

@ ,1q+s-%JK\_Zi8lb/Yd\$G=jpJwa[.`u~K.\$M:3bo]z#Gv}+m{=+u7]0d7/ 8<)Ocd3OwJiHZr'\_z&7=I1|\_\_<o~mf+% J=>X}wn5 @ @uaE>cmo{U+-[s5{Y^.#3pF}XwK\$L|

 $mwMoZ\#e^{[N?jE/j]7xy/|W^y^*\sim V} \{E7Z'N>l$ 

]

 $V \le mu \le 0$  @ (eZiZO:zpvXEu6~6gXiRv-5+e]lmm?

 $R\{/ gq <=\!\!F\!\!>\!\!3Z;\!nwk =\!\!Dqz + @ @VY`PUNsM\$[.'/lt2gNK/t7aLw4VM <\!\!le{\sim}ihzpWM =\!\!Y\&k + k'u[n9uRSZ = @ Marcological structure of the struc$ 

 $@*n?Xm\%)D+-m\%3-I\ fr2oi2wlqkt|$v;K0gK:g\%?,MN>3]t](Z\{ramC\%w6dr\%pG?$niMQ @ @ffactorset of the set o$ 

 $tw]:dsi8W \ 1_|g9V9W^R::. \\ +m8g/2xqfN3 \ xdJbJ < 1M^N @ @V] @ @`w^7((ML \ O \sim d=P[h)M) \ A = M^2 \ A =$ 

 $oxCy; os\#, lAs < dM?C9/yy> @ @,`yim}3\&E`L5nunn+9zU.'A; d~x'=<o); @ @Ysv[$ 

gYs2lZM&kj3j<yw&zV{`

7lml&UVH}c+M6|`Y%kG?Z<rFmQKVv6xJ:O;|SCp !yH9S[1 @ @

 $t*UM7; ynvR[oc]_W), orOY3; LxdfV[cLTs=oZ^u]oo\} > 3N:/iGqDy~fmPdN2iB @ 0;^k5$ 

?%w|3);v+0{ ii=f4

7.|+[I

t9T%6\_IZ?^sWM<qDi

/ @ @:0@sw{Zt4Z.h/zY60Bi::x/46.#8Xxoh5wnu.\bE3^]Fm-( @

mx^VnY7'Eewn6|^Q!?tfy=>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0/|/<o

```
6O.e{<}r'{\sim}Zw{<}){)7y5epq}gN}Gy^T_{\sim}+NwZ1{>}sLwh+muh{<}n{\sim}mz9v[i|m[jLyX=
```

```
@ @M@@`nnVI{c=v)Wzs*zlS_$Mmnsrc&=S,||OKFN+iw[`~Z7q7/|yX9I'4lpeo=[~T|y?% 'PJ@fN~6t}']u-uOovaYgU<o[|4d29tvn--[GY<zGn= @ @@
```

```
vYE:|\SUCxFySZ2`zky;YvmHtT/3wu&Ib:o6myTZ+u9\&6)9udCh_|X9_3|\&'w'okL7)@\%\2\%IQR=rm2yt:k^)u8; wN;mr\-\%[mxp+g]^W63nt[2:U|nIvr-g[tnMys'< S>\% @
```

```
@^gJN[l\46,nm:FNzRbwko]2qnFOw9:>:>]Y|yIt(&_yrn>mn55H{hsFOg6`M6i.hF$*8N$BSz= Q E:
@&"E
AE"BMHH ';?{fgw~;39EyI5nY%8Ju70dPH`QXZc5Bkb4)TN+{/K'G)u?/`'tRZ;CsMkD4_~YjtQPX{mw.6sT+J
$80=)<WPpW>8a[DKo=EM
3nG@@@@@8V?p;c
{Pc[5Kv[yiv3TRks%mT(B*hBw(ZTR!vRkykn5y4VZN
fZhG]vY>QP`@zZ-
"4Q0`Ev
`{i<)P,;g-FI}e: Zr.RSjK.k_=OU_+r)_(wPW?I/E{I3B6|*miRI
BR:hNRltn;fgT~9"*+10:O+(&8H 6Y{Q =Pw9PR0TR/(A~^t^n|HW\1ZNA)
a\b:m[1=saZVmm
c,'iYJEIc8?
K-TrHRTn
-]&[oSO=#yCW^ c>3585R>*MZGA>wP, |Ks/laBw0_ME
.w!.>4h^]`pvJYg[iL%me{PXc.T]*i\h@S](ja<Rt;y9MJ*QR
Pz
`ZCT[Q=!.Muz{nruo-Lve\uJV&yIcPpX/RXo*4z@@@@VA?zFes <*A:["PoV;@*V@fRt*W!
*K}k`SD_wuk1ITtH^-0y LwE [n)D2lVmYE5)sujM}k\{LOsZdk@@@@hk"5)yg{R 12cW
:uj]wfm@@@@jC@m'r$O7u3|dZ9O
zEx$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P*N'Y7Zf{w5XXb
{oIr/lxD@@@:I@c
hZ\pA\{B
6@@@@]B@]tn931e!v}h (@@vFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9:G
u-z'O.: z@IDAT c !@o\p2X@@@@@m7r @E*ba@@@@@jS@m7r
   @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
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   @E*ba@@@@@jS@m7r
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  @E*ba@@@@@jS@m7r
@E*Z(Sfmz+!P/|K[x@@@@ P![1fKPnNuj={(eD@@@@\,Ll3ljx|^'(_]
3WTF@@@@eCee@Vw]pe4K@A$]?t]"! @45S&&V)6[@Q
*]g$@@@@hVF@+^V%IR +# Itknk--x A@g8mpVm
wxuB@@@@TM@L2FQB@@@R@[j/hve<v}ogY=8v@@@@9
P'|j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p)
+XzZ6XsHqbu'loMkpMR?N}*va{g
?r?S^x4`mlm;3OrG;tm{}[o=klWc9&w]&" waj+mq|8{L,/&|]rO7:d
a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:17'Mb7D/o=Tgm _nMc x9~;,h
U3Jn]w7N<Dqme-
```

```
f'' i\% | e0SL \{cL_v\% B-XSO?Wsy^=Ozal-6cL \{k!msfwa;`\}z^z=[av>=dwf/|GvAJY3\% \wUW]f\#<bkG~slZq9~?),6\} | \{U>=*KH^{S}
```

 $i?{\sim}A5@YnP61!k?t; C![[dw8^5W6zSgnZ:d:D?iQDUi^{}]Z]QgTj^v[?/"Ya2 @F$ 

```
y)0k,eBJ$k(]B0@BIvwt'z6lM'w`)2xp2{=vW}xnw^=bU/''V^{i}E;h{)i/p-''N;-i}C;h{}bU/''V^{i}E;h{}bU/''V';h{}bU/
```

```
n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v_?m2`g4)yo-370"~|m_
Ao{We IR~e<5>|Vif/cv4
0
V @@LD6>c=Ca_{[`@?_8].+ PtOXf
'Ndl%QG
@ }ajoI>x^e~_~n7:{1A0 J`
[K<t"
{/T>)7Ll(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[|!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
FZO5~z, {!m:^B><Dz^{}\&+pIZom[[n^hwy]qo @i}NW]?vGrV?~vZkfg5x}nz`=
4h5ao-L\QyOx]I*}q^KcQ|=cvL?w}]hytV:&e/c|^1N}-PF!~zcOJ
<y?9zva9a-g<yX@@@:. |1rnvRK-
wv%4j{GwL>9K_6X}U/i?>sBj1UV^;a'n]sy7nc6pz7YO?,<_!Plz?D>[vi_/z@>`+Z=3a
\{CG;b]]U>Z
E&7VZfnlGkXVXasI@@@@@Z3<4HjL zoTZ78oGr=$ N,z2j!I}f?v'Bv~
A?dv}oNBd~9OnnSjg]_y]o)j)rQjuuu>a
:JM0!~%Ez?LV9Tjm
ue T:@,6@7mzG==&~r8:LO`cv{<>y0
@@@@#DRfi^[6|}WvAs{7dy|5iQ)it0 L*=^|"R:`G}O6y]u
6;;U[n|m<8y<92o\{(c+.:cmZOLmD\{I=Pj\8\% g'.'L;x5@*Z=/i<wx)\}
D2p<W>~{1z$]`Y/tLyIaoHarmWxS?g^{5l~Uw/2NIapxWLOG=a7yx^P&NXb]=.5>nLS!$xjv#S_x*\-
~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@
.RE]zC(:?;C|Ja'5
Tdu,^qufh}eAG/8iV6q<{Ly =_4i3lvlsYMSv[OSpbx0`9:G@@@:r_|q{KM^Bljx;uUWY
1
klOIOWd!'Zn.P`_^z{H;l6FN9j*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5:
H:196
oz;k/= fm/
?|;r1Tk,.8!Mnu`____{6*|:Gq4p77m?N[>TbK$!
5W{Wg4( r~ s:a~~=j5RJPo]/ol` ?Yn64@@@@H<#1
6(N;[lAm9n5GW%\<y/}{i>Pemj![{5')@]tAjS~9_lQw8{?.IS@`u[=9cg~gA5"><XMVy
4&Iw_]gWqa@@@@|.57kv }+N>;^)7?{F^d;mo}mZa_FJ<RxF5d^0Hp26+[.oZT`Bc(-
Bv{CRK_~5oZ[#?yzeIv}tw?m?z~<dv=oI
q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG
dZa>d_{11Hx};+c((G)|N.]^{200}|yU^{uh3lLe}|6=tma
35OM{Dz])]zi6),[50WWWgG@;=Id@@@vwJs~vM6B=3f'H}9$` yyOx9qo-3g}I}8->nj{%^Kzn4_sXfUW}p6eT
Q??aw!<cvo^qA
;@A-a:`]rknkZ<D>.c?_:K.Q8=J^SO=UV4f5j}D;L;+{z\B!+~:8s{in|/oWlytVwLz
&2`x *a}A%+fut)Sk*wMSO?k8&;{Wpgz]"2
;{fwujK
0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B
v?5)yzO'K.}cCWEWTm>xm;'f7[o{eYO>b;#5Gy7J]5xO<Smo%kCoeg{otOfW}a*/MzuAX:B`X
>I
Bww/k_<yd]
8~`^
;dImJw]t9)b}
```

|CB@@@:@N!wg

 $7bSL52PRp^{E}(Li_N_w-[1N;l|b&K?W_fW_{}!^{C}dkzzs_{rG}vp+:o5$ 

 $<6[m?Onw}wZv]$ `\_3o7>e'+/e!d.mruzKK^L|U}u=B=m=#&\#/l=2@@@

B +f TBY;)s}0qfO?y?5q;}<

}-Zj\_mn!<a7x8fc7fr7hn6xE[j~\_vmXqW^/\_z4\*jgybO

@#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8\*\_@V,<('zuYO>uX:=:~

z|Em

f^v!}Wl5-oz-c~@@@@@PK5!0mt+U\$ZR@c+.^R\nO\_]+

 $6grsRg{\sim}l{=}9n2]w{\sim}zK.wo_{|}\%g\& \quad @C$ 

 $=xL3f \sim S^{5}jS - (0gNBg)$ 

~[\*;\*hV?}]uUvGZy@`!w]r% @@@mJnkw-

EMBt=RYKm;ng!#hx8v&{)b]tQ;A@@@jCqj"2KA5q}&cWAjiu4n8O-(Gd@@@-

u}nOaEK.wheUW.d@@@@ZrL^

 $hKm < 0- m)-w@3g{gZ*J'}$ 

 $\label{eq:constraint} $$ '@<U%[|gmQUiW_]v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s]4Fe_|E>}t9ri[IT@|Y=chY@@,e1 Xr%m!vwyvgDo/x;umege>[j_~e]P(7hkYf0`@c=>h@N8[uUme])pAp$ 

onr}o!zvXb ;\*8;`&

@ h1J6;w}>3SO>92R{~Bc

6~8t-n}Ut

 $\label{eq:cappa} $$ $ c-gFzg - = DZo = cjvA/l. Vwu\% ?og[m] | 9sBO?pvGy/byZh GU`+Bhu~KCv : Z''m*s = 8~H; Sa Control Source (Sa Control Source (Sa$ 

@TSr-]ae7?dwjj^hD=M@[

uQT{K?O]ZO%5ZkFKZ'W\*W@U

@>6zhIl sN U:w}s

-qy4@@ :lhSp'W\_U6R=mmbKZLw]H7B}?tv5K qA5cu?vu u?

@SN 4(7n.O

z0;C=44A]s9^+h3iZ@@M sk&YD&%jCYeY9n.(gbsP]5y\*g\gq?ymqc M6-LVAL^iim}yS5Y2y

\*{HclJ5PkGkAD5Joj-w>~jj\N>9Oq?X5M%+/<ukM{@amu}gCD:AIg%0lZyD@hmvqEFR9?~.0

 $\label{eq:stars} $$kW}?GyL[q2,X+i^E[o;t?O@C]4mnv,H%vum/GuB18*9C7]OU|\O??ePUrK\-T&et{\#}9U@H]E60_>VsxyJY $$mdkjZx?-RW_~_.IrwU*} $$$ 

 $O[Y^{4Ht}[D.(K['xK^{U}]7]oVZkJN}GmW_m]vBs{:nn?7f;cm%wS6jtF}KU{$ 

D5ur-\*M{X`J'4fKhneJyuS,k~6-

 $\label{eq:constraint} $$ qt @ Q^Uc>.y<wNy!A^?|#q{9^pSGmJ/'_uXP&/L?^SXr1zt/n^dyx}y@:y<wm?<^xh_}m4_:Y?Oe|2i0O/O06Wj&`Gqn+hy^ QtwC?>fonKn} $$$ 

 $wO^W^/wMhM_Q\#i\#/+xN'mg6+*t>P^]rd7a$dVg'm;>Cqra.LK?x^@+=+<,WFm}GV>j?K/hO'Iem/+x!\#=T7yr@e>vR|q$ 

^s><pk2^Y0?^OG~<`,. m^:o}|\/>Cy,{ :-

vE1\_G~/qu,(:lkPi-<U<@|'\_\_t [{Y sZl!,@@Z\_@MJo?T0J4?\*&i6T( mAo^ky,,a#G|

a\*8zAS@ATA? 1it+^S+// U}9[o1Gp6B@@% G6|p^-((({}?W~kg&}pj9?UWA

### K)k

Ztczt@@[o

 $BC! \} < ]OTWTX \&yn5/{\sim}M{>}VFtR5 \&dy$ 

Z O~UNwQY/z0O9jV(\*xkY;\$SeXiDi,W<VP#T!@-uXC"NS@-

jA}2}~y/\_Wqe?la7uT+Dt}1TAV@@J@U|keK5`@4T0G

I5CR?TQ?IyajekY>#w^&}dw9F~.pRLLJ{P

yP!NP\*k%H\*+2YmvvG?QBtE\~XF5)m

y: Pl}%

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?f
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LLt8j\*EzX\* +jSkG~xXF\*TT9{

RqB6.)h]zmI0k\*WtRpLt

8Ic5OIRX|e-XnBtJBdige

 $j \{Nj > tN^@TQ-3[VoguywwlAZi=]]Ae_-T3\$_3i$ 

<SK;#-"

 $\label{eq:started} $$x>SVyT`W10/"`V^T@#~ZqItT @//*ubqjA<j>sux ZCm]1?-%T@Sb7KtRK.lXNhH6=+@,$ 

 $0N4 / b\% Hyv_T1!o < N=9_A\%..P$ 

lb)v{6X\$"ps^

 $LN-jeTN\%*W, pZ5g*e@s6+{Q7/U5eky}P5UV:+BN:(X.\{\#\}>\%T@IDATUT?\}S`$ 

n\_nrIT8KR-W{>c95z:PQ: Pebk}e;-quUl>VEreQdZ/RtTs

 $3WXy{<}X{\setminus}{>}T|"@{\&vV"Rs:'*Uk:Czy#}$ 

7xRyuG<>Zpa4AR5Pbj0/Bym0I

/yM0^{5~0Ii91^\$y<Kfx!rJlyuM5=&iZK^`e

N#n: 5?A5bMu $x@|r's^<ws41ymq$ -

 $@\#, \\ 5t: A`$yO/9'}y \\ W''=0 \\ /M/_5]z(G`z\%81, Mk\%uBd\{tUBUM8i<`j?[\zaya5jTk^Av=nVrz*i&O@0L:~Yg'D\{5\}] \\ (A) \\ (A)$ 

 $@JZ?(\{YpIU*uOoy4Xwf\{-+\%]1QvJY[k03:\}\%?\!<\!\!A\!\!<\!\!2pYzyZmP$ 

Yq}\$c\$, t&\_9fgyuox|SAw`

 $]|R@`o^@Di]\%-T|]7SA[ytOb)oui$ 

 $\#5Ov)b^{<}Uf\%{>}1.\_Ftij@5{+}\{w)~b|L_oIm^{\x}c&-H{-}[$ 

RI(Z]lB]\*|'3uZk>J3c!hv-u.CA

CRhV[^a

 $\label{eq:uv} UV[U`4lS~[X~Fm'7z?o[Y5uy$l,>A]0]1]cz]83QR7]'VGJ, UgZr*xlL*Z?\{*lyzc9p=\,^{9} '@@l; \{pL*oN|4Q?baK\, O8Gov`oB~k!\}u>^u^dk-Zb-xZk?x(^;t1mq-V~rSM. 'U?$C`ZJ[lim9'qMm|L{Z*0L5*UZLU^cMRv^=*W@MLn ^P} ]$ 

 $n+x+j\&{sk}$ 

UXG7jzeRJPozxS;vj']xnTUR)[LRjW9Z[{8:@nBZu bMP+>Cjv^K.Osi1n\*Smuu'

T`Z\_sBM:5T?//S=unOx3jsg6Z]x SoguU5Wxph+v-Uy,\*'.W}){/)B+ZkPV-^

+u#:4Ku%@JM0uZO2k1iC@h!-6:CKugbUwJUit^jGTV

?5WI,tJ/~Pj^g^=WJ|mV>mWd\_{^[Knj;S/

)+@ ZO}n&EsV,-xU[ryFR6]N-q-B}O1\Smwx8G]qEYbKKu/-v'8Fj6,|>t=P

 $46\{ijn\_nC="b8Jm@ZSu>xq)o1=MK"JVh \&\$1\%6?\}iE](vTTJ4DkGl\$5*"T/M".RCI?c\_1], C@JN1NB$ 

 $+ ETT1J*XzsI\_, \sim J > Td1cnM4KV \setminus R[K9P[om\_|q{PQK})ET9]tVYWX = g'i*XH + v\_o1R + t$ 

Qp2/)`Z6)P{

 $U))'Upm"m?u{Gj!nG@@~6b/PQM'TYk?b5[8PPMVYoyI?TIM45c6qcH??q(hR3XRIkT.dXhzQGE]LdF}$ 

```
>uE%u]:>JB
E[K5+?SC![W#|h,=$/g}T0r(oRb7"sn^}0k^^TMn<0<!kU
*T!
65(R,/j?:/F0+QAz]FsQz?eUVm@'+~~[>:S7vO}?{b8?>*>GRR!*.%]
SUZ{^t.)K\zhx/k6Rk)^JZr=9wX}olx/Vj5.QwI~,BC1@@uKbUi#uAY+2mkN>`#e`5^),?
^h iK\d9T7'Z?L/(N5#?{wAV_
|[Bd}b)YW>9#x?f<PQBdlyYxa/(xMXfis0Y k57O@s
{|SR>dW\qE2drD/,y02rA0k+:&o_`S?mb,x/hkm[4 ^c2Y],eGe:?}Lo
9>F8s/lpz<=Fu}`7Z_TJux/yk[9kswWO^{IEljW/p.xkl^^{gB^u|<dk}}
Rr2V^{\}[3] Rr2V
k;)~hc-u2@@VPWU%U*~XO5^t
Y}EmNlq~/xdy?KC5mz
^{*vy`7bNuBio|*H
YGiubA^:Z@@
&)`
TBXpk10>P#nC@5?}ULZ}Vw,\PSTn@Nm-We^Zk`{zh/7l5n*4l^Rt\fM7[$L+UXX9Zss>py(Hup[$LS`)~e\mx
>r+~[>+
`i*yY
*LsHeT}HjIb=.pW9UCA6J;-
Uo[y6dHjz
:L
f+!Ts
* '=C2B'W5Yz:k[W~S_:d<A@huNvNOjG~x#ED|0PN5IA,hPxz5i* 7T&ov]b B=s85Z13!](S-t~
bmOA
XG~pQA9|`vCh!Ki*85UEK@@kpo2"#`5G|K%.RxI(,VM/7 Y?#
*W!ZQK9'q[i
[; MZgTTy*z, {J?
h?-sSjkQz%JXJ*SIr\ONA]|&_Wog]!}V5]WK=
rV>JF5U9#+}7PAZ6{$ <<}GL S
E*.%PKU(J+FZ-[5
+gyfA!Jt/wtTQlmRN><Fc @f1~b+y]SYRvp@-?*Zi7
(f{MzB av46P?-_uVzygfiqyY[OZ{[E}*+/zj M/D
w}5jW'~
/iZC^(jt.#'K4,m|.rQqjA_|?mSya^=}Bx
 V4 \rightarrow WyT
sKcoI+Nnw<WPg \@;?Ad(xDcj[
I
d`Wz59J@@@"[@>=
t6J> 5,@@OYG@@@@@\UXZD@?n
JB@@@@*`JX@@@@@<id@@@@@JT* <id@@@@@JT*
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  @O=g!
5!pqj"d@uh!l@@@@@v!@@]2
  (a)
          @ .N@@@@@@uy 8y*LC@@@~>uG(@@.@@@@X:h@@@@@
h]
D@@@@@;u>9@@@@@r0@@@@@%@@cO@@@@@\,LD@@@@@c XA@@@@@
W@.@@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\,LD@@@@@c
XA@@@@@W@.@@@@QX:h@@@@@
D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\,LD@@@@@c tX:5k^E>jDKK.{X#& kffigv!
R]puz.E&@@@@e|aOasjz7|0d=
```

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qiituFB@@@@ hke4 "eUt])
2 T@'=-} !YKo! t`hpY'$@@@@Z@l:)Sly[Q\("`{^cb4Fc7Xb4j5*1{
 o}>n{9sJw~s\@@hIZ6,7|\sMIM0^{m;m%s3@@*!/?Ywt\44'#GonF9n7&O-B}:TU=nu~b~tV[m5Kk*@
@F<Os6sAwn~u |
f,W U#lCWd=eT{mUW)
}o;e^VX~Y[j!e&hw;N;zCo=ONoKh8_3;{6qb]zwdCll>_YJ&g(}]{;Y?fKyzt = zxZk-kmVc=6w_!@ @ `Bj
6hzGK[6~]r56nv|hN7~so^M'=N:6>S>n
_{y*/\&L\&)tu}{G|9^[/]ofIvR:gxWW''{2u5c'7n7}~7'&y28ze]Oa'oN)y:$7N9~m%(Y @ @
6Xz & O \leq U \\ WK + wg. \\ mE \\ WV / wc \\ lc; \\ ljKlSNg \\ Gahp \\ Y'G \\ k=wm^; \\ vYc; \\ nuzG > hDr2 + ?f^*, \\ 4^A7l^{//} \\ U \\ C_Fmwf^*Z, \\ Hard \\ C_Fmwf^*Z, \\ Hard \\ Hard
OwREr
v;![L.\1`UiK/gk~5uckGL+6x#}|Xsy{Zuuq7>jtGvA3 30f3a}74mnw6ulCgcfU0n.v]wI'& @
 @ P"`Hn_M'FF!4/-~fk[z=sM6 O?1W. #c{3nrMk:W,:imQK+>}7c
/gsoP^};bAZ831^fdM:_Vzu$->IC@RWFn=1$mFWn]bL:+=v]|O8`4>V2;.E0O7xh7Q[=pr]M#"o_L/]fqe|4;1q3,Q?;
@ @@.Rs)S_=g1B+ ehv's8k:rhv}}`XbvdkzXm,>9<1gO[neMkLnqrH!Fgz3/?g-$=Sox?g=c@\'7|!iR vXo4Oyztz,jg
р
% @ @ C I'O.mbk?j~1[]eEZkVlgE'}aOd\^6X]F~q8blVnNkWJ+X>tV>}"wM6J+r#({|mtvXt
eYA^9 gEXw8V<
!zMqLNlj\&+ww5|f|ov_>Tg^i7@k,z'.~)?'o~<yvr86w@=lW;Y.2\v6x:3fG?qE]dwq]qo@@4F
W]?z{7A@.c.{AnL8#uos
3f@u*vqGa`L
oEX_j!r$QP<Q!Y>\%]V.s|oqnTpj}Z/Cj{j`I,|&@1/+at?>.TR:{g~h2>FI^{4;Bf=-}}
}7[{lm-g7@ @ 9?v/
`/=!#GwAIy^juW7rF*CW_XO?_ynyr'V\a9[
)p!o_oq3w)oy@`/CROCYy?7.g o$l]:n{.N$k,]}t6+wYc?QvE}9
7K$cfuq1@:?^&Y:@ @ 0E2>IS(|Dmf -C{n{&xN;1?)Zx'crv\v9T?fg~j|m1`/{a%evn+ymNu%(AgmpD_-
36|m] < F \sim |I.e|f
hE-Dn$|-{|nZCnc
45<v}Pw'&f\iD)3nv[AT}\g.Wd8LO_/AYv?AM+B @ @@@#jLi6,z<}7v>~
ME-~`1 K L=
r{NwE$9^ggoW]{wv,[nV^x1a;I5fhkXnNvYl<c'~igy}i<~=8p^19SK>j?pXuI
d
Wbm < *j < w)
 @ @H/(=q,K?+jqy~{s~a{mL+?yJgg*K < {IK}w!w~4}q}I
1p5IO+>>
6j d{jcmuL-Wi~4^pX2<ERV`y4KL@ @ P@c:V#k5^zbFM^r3{G&w 8mXz,K(%,^=h~6Cn}N=,+
R8W_{..}fh~vBfd~lgw}gjzOP\&CEo0a7~7M+R@h~oO:==?8u2e=gnRK[:M%doo}>C>@@`C",b/%v1,-(vOMo.)
zcG[img+V|Ov_X>zWuJ?]tih!gg!!/U&Zs.&3U}-nv|sCAkHct4mf3;Mbg]p6JE?g|&Ky_wr2ey-@@{
C[nisOW&lR4nrxoNQe{W_veY.>,oP)iSJr~8^.PoSk_$[}U2iGquoAfHX{5a.11WXonZ^hMbOvQg%LB}:G&|e;y}
JP;f5hNn3Lf+ymeH98pqv_{U'''} @ #nuQ}q6p <= 2jhCP_)R; 5h''W_ &H%W/d]t > V-N+g)P^q#CzJ5b'''A'' + 2jhCP_)R; 5h'''A'' + 2jhCP_)R; 5h''' + 2jhCP_)R; 5h'' + 2jhCP_)R; 7h'' + 2jhCP_)R; 7h''
{k^H,T$fq Gzn=D
:i!vP=13)7lUWnXc.M29LWml+VhG%" @
'j:t`<~ZG+SO>mtvz)XZ<Gl^z\d?=0mz2RK{zy~l&Ct^\WC~t.<(5L+e(& Yxbek/rMkq2dHR-
```

```
zd9|=b19+gd?n6S1@Xq32_v~@ 8dA @
```

```
r$z,)8>{'mQvHb9c(D1bd\mtSU`WIpNr3Okqm.=}a{kdrK\b`[z:7`nW;ej;.<n-Yb\%o:Im}
```

```
KluxvRQD=L]]T~[g'E\:>P9s1"|28< @ @vsoBs~
64C-)Ss7\&4Q;6[Y]781c}y[]py;]iEUsO[vI^\Oy6,"CM2:V]eU;o;roE.l'tMJZkPg)k7_F`FNy9jzW2]}{+{Ci
?.F'_Ly{["1utyAlUD1Z*u)0B @ )QYh
W|O?.GsB[zi
=
_Am.?.t^x
l[:cO-f]v/ecgWO<&}dW3O0"aX>XmOlukzy]Ng+vyg6(:kd
ZtQQU?=6w+{V}vMZ[vi'{j.w}!wnYw_-NXvU_=1u^{v.5}8uq7w_UWO-if}-0_ckk^{LN?}-wo[wusJ@VVV]
@ %P_;en>2/6q$,AaPqz?\/;FGG`g7LK/5/+^`H1A#[v7VV[ehzd}tL+-~Ps{3t5RX F\]f;`>c'xM<
\kKilYbo}8Bh6
KvveXbX[Y]:100z:wV^G/[~[*]WPg=4>C k/)@ @ 8yGU:G~ReA?ZK4i{}
Hh}'b/|.ju+40k>o>_5z3l\K)h{6WV49wp@V[9J[m*,
X &/7n3M
s%
x7mW3k{9@ @`.'>e.> 0CVAVS=A?_x^xV_}MU({DfIOL#vip&O,{iwygX~,!@
'AeP12Cs<'lo~:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @
P>+J 0A^{T}O
tJ&k. cDYsb<}gq#Gc^;hom `rH-C @ @`&9+F 9sf[h*u%YShB-dmUWz>4/npX@ @
0C}6z{QiAmIk3"%\2=ztLb^~e[fePh
@ @h_!Wnm.CKJJ3-OXn~1@Z+c@ @ 3@]lA+7/<411"-a[@ @ Rv4M|5>,AwH1j&hBFW @ @ ("@%eTw% @
@@mC6\ @ @ `hS@ @ @jC@mR+ @ @ @M N @ @ pV@ @ @@"AM@ @ @
J @ @ 6Ecj
SN>c/xk#M @ @";"f<c^b7tvU'v:\sMr!!
HhOqL28&2,3xZkm8}z8hI{3?O<>#S]!~
>E @m"@M& CAl;lG}}&O>".ZN<puYUXjO?h-M0
```

mUW=z!Coo=?hV'l+7|KX=mu?O.0m4lwv)Ur

RKnhzk @hYZ7G P}&O?]c

+A):AYeo04g'Md7p5vu:.\,x7\_|akUANv[xfcvj/f

```
yA. \\ \\ 1=z?o3aAg \\ < @O-\_\sim nfs \\ 8P-x \\ \sim VPN) \\ @\&M_! \\ 9lwuQvu, \\ HMstM+qJd.M`a7ki+r8ZUI \\ @\% s1-T[)x \\ + (basel a) \\ + (ba
```

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ifw F?a \ v\%rUWAUVYV_{u+!} < 843SN\ 22l/0d:I
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@cKZz]}FKtb[ou5k1C[-!-Ac<c\m6@ |IF#n`r#?

HYN;-VmK/

^7zrDq

;`Ljo[g0)Lr

```
@@`ji`A8XZs7WjA}~\)NjUsr:[Dmc47Hk"5Mkuk2yu&>yELX{Jk7We5hnLyn~j/frYykP#$r_"{ayrkGqGdc
?|pK-$b(*_;w T:H@}@0.v{~gb,|rqEgRu=LU>rK?hWKz;\"L-]Nb}IJ#V,MV=ck bX`kv3<[,se^xrUu1c$|C=4ur
&I'|/j{)K.d14M<wqWG_z(!
|G[nPFuh_{<wWLZ:'pz>o
#FZ. ?m.F_r%E'o_d'w
c
's9IR9K(F_>k[
$)$>'NF_XRF
r'RnQJBr
kF-}/Vr.L[o4=TXguKCg|UDI~|6Y^1QLg$r.V_|qxK-Y']_?W;V[-SQv}w{IWT%{Wh~:~8rH;IA|Mnk|_ 1-
m^:z(fmVyYi]v[X4F2~E3@.h]%gk<~wIL+w2<\(A/!
@% d
8qB8>
XN5!*o?+sr)u,WzU}2I+L\o
```

```
J6ktW+
рM
d[B>y G}tWGYpe*|wmW\'e+I
A^W&Jd;/oW|t[AH]!Qp:b-Vt_Vjo}&[BNt6]pe78FcG;DI3r#L:
qh
bqeJIDl(xPX<Y}
+B\{y,]vi\$-x^{\wedge}
!O?Jt
nNK1\=y+6'Yy]XpCW<H
r}*nMzT^ 1
n*.8^(*)tg
/g += \{:=)K; bRS'': VZ^AA^..c
tcB:vcDtB9chY]@h:|UA*|no=cJ)(i)v!!>)(}D~A?){VyI?R+:6d^>99A=*(PNmH> ct2pR+//HQPDt#
RxKP%#>>p}Deg[Q?[XxC0|tfY]r:?_4-Y2H6}i[n 4Z-r"E(H`2xe
"-jo1.o]tAA_qbSFK)GNm:=nhpetyFF))$O
z > 0SLh/i > + Q > K3
>C>o)+U_5RF`13txMV<VF*d|I_NQ'm4ln^zGO'[%O@Lu5$e{Yi:?jM 2(A_K>}y!VyvhPu
\{\%\ 8hDK\ s22\ dE\ s.>\ k=+>c1ylVxiL9RA
>{{c-@-C@p(#Rj'c@v%l3Fh>$@KCFeUg$@fyGw9(#welvBYI#FwVIL+D&F)qJ`R?ofKKwI~/bZAe41-
iR7JA%ig7[M$e#)Db%-jw{,_vRdFSGRrRjU*w?<kx8\J6.6Kf&KiqLyzj)gV4:Vy:NZJs7Rve
^\>=1h4C2YU&{Nq6+i#f'R*XRg<OVQYkOn>TeTVA@2y:Wy
<o&C43m11
*.|VmbYJPKnkPh/6SL<&i<3.
hZbr
]OvI|F76CM'AB)7U
sg\VOk>7bH\aei?Js% }Z5e>Xb='|rHQ }w+
WPJP{$a=l5JUn;sClv:l7ee v\;ZL}tGR@Rq%&5uxxl[>64P7{,dEA+e,o z|C~Z"OZS9'?TB,E
I@lmL1T|U < Yc5WGmsXD + %{>E~R{QuU{.c]b3}<m}
0/BZ'|E"?kw<R^Sz?]"b03a[tgEB3(2?Yb&g+pmkPD.]N=j*6G
a#45WuJtVs
Q'UoHc7xKT|#)i>!HG
F$g
@ rj>[I?ALuJ|SLnAGCtN)|~:
,@1?i%d+Pc.O\J#KbPrM"B4(P]{wA@J<VWL*b1bUMEH^Vz9}L+*ilcz%vw71x*Rj,f~^9W
(R]d$4]k.
U8O:1e Mkz^K.#+<#=x>3^\*JsS/V)#$[neXAJ3iV*3 2k~VDKFz* V5W[IgR|RoYvs<;];]R,b\Vs
FzG7:u mQ|F4dps[=>|R/)Yg @u4: @8saTjS<bd!S(wR/+^Yi)^"RI$MEmM7-V,(Ug,_`
3yNZ .)#'vk
IXez2I
fIA^l"wWE_c%zsneKKY0*W[kRu]4*V3)RifDAJOhwwr_aj-Q
_{iRKlwGf2`DQz)@[X+AVK=K#m<B0z1{?ok~&=w?4'}mSF{}W
z[nLxR3QRyK%|Rl-qVf,>-</Oc&Y")S;;\!1N|@ 0CzsM
6Re>d}$*[bi
1?7u)C}q;SW/Hr;rj/uFi/}N%~V)%Rhr$w@>f'gf/Jk)TZji[dA0RO>&t)t)2$no8F8=OYxIK
}RL[vM|8;aEfhFPctTjv@{%qFAZh\0Um"/!>8;#Ul3Q*y3bCwZwT`|W?R3S
w.tv8s1A!O%ai`tAKm!af@'MA9S
```

@3\*6W]ItTiEzcz &4)=p'|thVrFii\$TkITJt(V\$-9aLzHx97Fjrz4hk7v/e/r^dYjk[orUJK \*A@Ne zd6~@6kbc:Ck]

XE/[9)tE\Ri4W=A2hFgd,(H%~KLOV#Eat-ER{b>XOzvFjoPR5>iGs6UWrnp]eReJ

fehK\$D3oKQlC -)FIIRYGCEHiMOeT~)N)]^@Tiu[Cs7^7WUso;M]4{G2DjdF@

iFvtlQzk^=J[ySsmK3J\hwFPG+8v[n)t,?bsK)^=1"dMO|N]AQ

 $r\%|1OOn4G8s\text{-}5lg5BA6H > c < 8\{ td24H'NSRB3tMlSA[.z)r\#KP^W + @b \\$ 

=dtA @Z.Z:zZ%CSE>RI4"?-

r'!ED1R)+"]\*EDJu)

EEs1--v B-!9QR4u~Wl{Jo7}rK,>bF=xx)Ys.Qr"0--=-bAnWt\_#74 W=

H1j>k6dD5pGnnn(^34 +zg^pIr&k,n\*osT~h\$10pWbR7rMqRBhDJnqF3ed(3L{`=wry}.yaQ^7)s'u4k!@@%0TBm.G G|VY%F }guVU}UG6-O1tiyeijkpKhOgzR?H54O-WJX.\*QR}(R`RGAu-

"^krk7`\r~1=;.P<}\$R]/]T"s+,Iy"cFrK:lC>mV

K,SJIV-

 $\label{eq:list_star} \label{eq:list_star} \label{$ 

 $[lE?^{>:W"}Nr2/cJd]`\%?\%.B()\#>R9IVV^{y^{a}}cIg"qU7,(pKwK~\IrG'a)$ 

 $qCEJIIPXkP \ axl.:>^>>i=! \ j7+'^qE8^wn-$ 

 $DWrniPgN rAQ|M!2[L|[]v\g4WL < e\aze;?S|x+B?]U+)_{\# < PF^{+}+Ae\$}, wYskg9Q$ 

 $n19YVsNtOV7?y]uO^{t1}=mvghBY\} < DRF\}Mu7\} > nXL \ Wu-rIzvONi(x3bs\} < 6w\{S^{L}\}:zJrqg|k$ 

m# @URtIYB03P9#%W-FpR>4>Kt@5Pc^~OcR;GnzrN}Rg2\$o)UAvEV-uKiefd%\*Nu-)#b)5b3R!|TiWiB-

}l)%CRV(&}N{)I\_5}vA7=tizkh /~6[RJ^DJXf

7+J)}>Gyx/Vs. )G\_'e|{^&R~kuGZzu9ro,7`B!eTR~D^\\ yb>;:~OJ,zdHdXx7;kPqCO:@\$R2gE5Y~2f1Ik\+1 -2zgJ\_H'Ly>3!nr`yX\*P

 $\label{eq:2.1} Z@".!D>zpg t{Wp+M(obCA2Q/?V}#W>hc}.\nBH5$'R p_k2 #u&/B)on82[|6kBMU{+r7Fa*|Q_g+AMHPZ3:K>^b!WdWREC5Dn+Cri"W4c5z&|(6GcXVAc,<?\^ls)#]UMzF)MOXd5aKrcB\o2$tt\S;Am=9^}]3gY:<7:OZy9TkJd|Ep ^\tn~[>$sN.W5\%uP5>LaWfJWL!-y7z5z%R*r7~KE[ @jK`Y69O>/6h`5{tod}$ 

 $\label{eq:heat} H/RT" QM XM>MFvv"eBTH) > C>d>yn), 1EoS<^:/>z6/yI'^h; N^Q) uUs.KCJHX\_n5-N2JQZ3mLfC ) ib[:IRcg -y(w~KW,'N 3#v82F6NOpv(.Hc K #z/W~jA<all!]Wkq+ WcS' LH : NIi& 0L(QD2dUUw[3wt^B m$@m@6@@']D.@@h9m2@@@@`9b@@@h} is@PC \\$ 

@ @ @h\*M%Fy#8@ @ @.\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J @

@ @\@ @ @@%0TB} @ @ @vvh. @ @ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J`@ @ @\@ @ @@%0TB} @ @ @vvh. @ @ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @XNIosl@ @ @@\$vyh4 @ @ @i04!@ @ @vyh4 @ @ @i04!@ @ @<jZ>

XM5@ @ @@

0Cp @ @ V`h+gv@ @ @jH@

R5 @ @ @ V @ @ j@ @ @@[!A @ @ @!5K @ @ B@[9 @ @ PCj!@ @ @mr&h @ @ @0.UC @ @ mL@ @ @@

`!\@@@@PCT

@ @ @h+03A; @ @ @5\$Ap @ @ V?&dIENDB`Screenshot 2024-08-20 at 6.00.11/ PM.pngimage/png9 A<J

EnUsI)-V{!77

 $4y\_substg1.0\_370E001F*Z\_substg1.0\_371D0102*[\_substg1.0\_3A0C001F* \_substg1.0\_80020102*U$ 

!"#\$%&'()\*-./10PNG

IHDRpQsRGBgAMAa pHYs%%IR\$UIDATx^xUOH5 (bG{/XQEA:H&#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a\_010 aL`0`ca0/d8')QO\w,,!%;5.Q'{R4om ]sn\$&&%gRtiZ]v'RJ5"e S"7+e]{HHH7hRZ51xYF9a7 L(9cwhz),,,2 'Tr97N<) 2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\,Br[18x'5"31\$3cr SR%19\$\$:q}uEE:QEt]JJ=[sm~\*zn7sQ~6L / 6u]'III~M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G)\_~z<o\_U`'>z.Ai0d%C~\$2gMC9ey'oV+V uU=OnfmB><32o<ZQ1+W?:WwG:7\Ciy7U;:u^[YT,/hocQF,k']R8/+=H3bDys<5\_'#@.x6vcw'JxG>kNm\_,/+H >a8IH<m\$Y%Av8]{`W^&L# n-vqq,ID4R 8VYnX1+~)yJz;Hmw>(cueaE0^/BCJa)hBK"""Te)re^z\*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF\$.]5/\_^/.S#/"|N=zB &Du 7H^]xzu3DK/Tvu\$\$I`RbE];oms F}D5kB{9MAL ;|cCoQ/I\*U[R\*I}D!GSw,<yS>{85.%\$cc;#u[z,uNPy iS?BoUB)yv\$+nz(U>+GI HPHTQyNuRSYP9E}~J4\*K{7mM=d[/Q?JrRx1iXw>5Hk?y0Y\_!F W  $Uc1tEF^{0}[nUc(k6 b)RDC]B^dPpMcGQsBO-4w6mTG\0wWQZ.erZhh)/yP7q7mN) d!F^{0} ]*.$ 12 q1B=OR\*n<pCZsHH rr5w"9NY0Y.^Ifr8&E</VIJOTX:&?!W)fy27GejjW6OSeo\$:b!=<1:mKw&cG:RCV}\:y[N6J/?%on.t00oe2e,)WDwcd =&0Yej(Q5BGC 64^w?gysZj7F F\02c;S"##5 a6@C55~xft1+5?;PIabL~~?j 4iDCcn5rkOC(&Nq\$6;GI: CP3/'1\$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf`iqqsJFxup\*8}0IZyOCI{H\_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B\*54Bn/k('\z `yA`rAp^\$ ru?h[O <-FVr3]Qp > lF $<\!\!B"zn~F.inXU|?"nlD}S<\!\!K~7:>iOOO||D8g^k \rangle = \#Jk*1DjH6m+-<\!\!>qvwUnyv<8]R`<\!\!8zYG^>Ai*w=w#v<\!U.JE@\&$ V14#wFlbsB~->[m2."mW#?R %M >5R!]Z90z?((C) uM8hA?  $\label{eq:starses} 1_`.XfsAXnc!6~lb=(3^Y9Amq;3F-{je\%6.E;,gx|QZ\backslash1!F\$7DzyW|;wgh\-TYN[0'ieRPA<>-$ ^\*:vm2>&`TMX0W\q16\_CE( CLXXp=\ B > Ak $O(O+k]zC[1g"+Bc]/b+L7[a*<5y5xG%GXF{L}]{M"8675}]3?tWg`i6"rzW~Cn~#<9$ 'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt\$BE4&)O 6q?,\$@^qC/>|; {~9r4ZyUm7L'5/\*#}\_zB^yQi Q&Y!.tV(\_mx\XwSr'wbwQ 3 BE^\exp-?9D0&52-Qw'|P7BKy  $:o:;^uh}Mg[!]$ 6T\*z7UB:Go2^+HP rf P<1;KK&<%z~}fxS/(mYp#FR{\$as.;/ecAj]xxF-'88(:& O~. oqoOnO>#<,tFhFzO6ME)f]!,Ai@IO}F+3sw!(\J;J\$=0;X"e\_,Wwkp|T(\$q )a+a0B10Nc!20/a~0&0a\_010 aL`0`ca?Og4ys25a? >#xf\*f}0 w8Pdg1`rIy%@2Y#SoZ|t\*)(w0?^033; >0M7g+b^/#?ff,b\_7z>|coF}xYJa^{GPcF`be\_`.1>LLufa7azfka~gj}1\$&OSC;V0k&f|udNUV tRL701# 1/B -^4qpQ[6 @x N7I" #vL8I 1 &m00Y 0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3 7nXgxfF`/;Nk  $0L^{0}(b0xg<)$ a5yk = !\*[x?]/>yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa >[|w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad% LLG,;&bkK!rK\$)o\$\_BrKHB5aFVOF#'|<\$x\$qew -

 $a>vaYla0/a~&?~<x[\&;O_:v''EnLJ<hY>^g;11In|vGK2lf\}Km^I\incM6?djoK{O]uR>Y#BSofx>xvo|$wRR34Z{7%Gb Gl_]7{t YY>&}$ 

 $\label{eq:2} zHy7ePLqiS=!113Aeo~p\%:_$\% fNLdLrRb(/KR0)QK\%:*A;:L@BhNV;/$rIhpq;,Z..FGq0|j=*\%hj\%1tCLXpB3be$+ LtHsY1KBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\$KW6}+E".\%iEE JttOet=uP9r$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu*/A;J*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH_sRZSjV3L*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G_h;vJ.WIS$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/*/-qZ*$xGi{kU!=nNs.i} LO>%KX\vmoT0o3&w3v.JHp${%9N%t5X@x?9TS7L[7]BQ"48]Q>yt)E?Ux*R%:YIqz^[wyIA N$:9hC:IK%"<\=2h{Zx#$gD} )WS6&@Lx}_+Rjq rcP6pUxXDt$ 

 $\label{eq:sonward} $$\circ\rM/g^L#4py;gK7V|8qBN5$$ 

 $\label{eq:cmp-a-ikzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55]>8/c%Kh2s+Sd%}o-Gg#GW_.=n=S#}wMEEEK1&0K+v.]/xuNM~3]0k$ 

 $ERjU{+}8{+}Z{*}UJc\_isCd$ 

j(c#}{9YpH"bPv[u|h5r;

 $mr | A^zOzin/X \{ wg | sMtAfU. | \} d*m6OYFw^] qRX1 'DvNCs6n1 @ [8\&n2] 39O] = Chm&0) [I2ug? < 6]) T"""hb = Chman (Sharaka ) (Sharaka$ 

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D;vnT\_V\_V-1b@;}QYBiOOXB/>xB#c\r.?PQ0`5gF]mFg8

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`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T

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][opcK^NyB

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 $+SX1cG0@;CZl)5J\!\!>\!\!i)RD_f\!<\!\!M6vZz,\!ukDDD]w\%$ 

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 $0 K dy9 pzyFDz>,\_~,XU=q];]IS.]n\_>a,0;er-Rrei=ZsqTTI*3gn{I[7INN'|Rm+'OmqqqcG.9R>\backslash4i''=?~<RF $G=>n3r:}$ 

 $]3gSBBB_k\sim[~IZlnZz{s=ZF{aFvOq2qDcI]e1jN:uM6zj7]dIOaDgxb]mn`1KUl\aZjic=o\~Z>}k;, Y''k>=!5j(TRZW0\# [38r4K{{^zy<.e+(P.'|P3x)}})$ 

]v

$$\label{eq:starset} \begin{split} & |\&: \#ZGNogy \sim \\ & i \#qyi>gg \} v9rxLeDt[zx<uv]^bqBn]1b.;"q]G \} VZuFzs ] waFv\%=JeO \} X L.? \\ & \% 6KLL Wq2`wK;g:G/z66l +W5\aQhtE{_}^ytsjy;wePfrB \\ _hhOW_?\adW\pm8wB=|L''OOE^G> \\ & h|GENkq?r~s-)+ FUTnIaCh`?# \\ & eG`/FtIjpGit;2r9so\& \\ & bm?qs>pq{fv}sf6oku(aFvB=O|Bx1<yRYf^x0~ozWf"s70P7<zBB;J2"zcygtoY,]TFq*zBy!'''''4aF1bgw/5gv.;Q9)Sg{ *^X'MNtc=58^g8_Z''??yd]v{"EN4t} \end{split}$$

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.g8y7xlsD3<xP-)PnSa+g^gT\_jU

 $RPL < \sim C^9 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% 4x1F6I-^L?L, Zc? | X]d5S^w-W_{C^9} \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% 4x1F6I-^L?L, Zc? | X]d5S^w-W_{C^9} \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% 4x1F6I-^L?L, Zc? | X]d5S^w-W_{C^9} \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. A = w$ 

\_;iM7\/NMIn\rt?~o>UqQrGG6KrJ.ye#6eI.ykH%V)<54&&d\$\yQu&G."i0#pG+/]sn4n@J\*)Z\*V(/2zOS9x\*x;^y)\H= &h>11ddsK\_-RXohhtpHagXd4hwf,>="qP"X;LdCA

 $cE4&yUdJ*a&0GQ5a*@;88Xn~v_pJ2e~+V={eZ2JbRo ^_j>/. Bxq(:Yn*|g{,=^8Ni;Q2nGmKUS&gm]`g_~5-} b_{1}M@) L = (5WD) = (52150-2) L = (1400) E_{2}(1400) E_{2}($ 

[doM@\oIev>5WDg;#5dGu-2uL[bcj!4GRF5C~QR%

W>GvkDHDXi0B>-K'cc\$"ZDh#t"K2eR0/9xVNQ?

۸

$$\label{eq:solution} \begin{split} &5U]Hd|R@~Z\#''; \\ &6zEyQzF+^{$p/VTV,oBTx&5M}ZpIJNyr;y|)Q<X6iIOGD$8(@NHp`(+7\%HJC8QY-A;Ud6nO;eP^~'5s0:t4mR5Dt/+VPPAk*73BmI~ddYagK0K?aZK{nKY7|-~wXby\Y#Bps+Kf|5jwYt^{}LL<Y9|8]v./ccc>'N x0R`#Y~KLLzoO%?~XY?^7 \end{split}$$

?f6m|@PZ30-4z^KR

Kw EYCz;>

 $\label{eq:solution} $$ TM_{\rm e}:SWPbJ~sn\#Q5[>izn:]E](~e:Bznrf=(Mn?u~qlO>=6.\8{m{@nXmA5k&svG#c<zhI&rj>q`)g?F&M+R'a1} = {MC[j.c<wUK;o<PBonM:u?+BG:t([n;u(~PtiOs+1F70M@-ZTo)S$O<1r-_~?_G7n8}];1,-[V[!</R>$ 

3L:UGHioJaRA\_^{K:mNFd\_\_A#

5jwO<KD'\_7~'\_aVtMa,}QF00a,YRsW;WK=oV7n1xkAz8P^F S5k[H\s5zN.BQG;v

W>N6#;#G]C[oz-Zq~LgqFon#2<Q8?`ct8q1hy>-381#Gj;vnIvy#iFcq~.38MuyyK.g:t

 $\label{eq:constraint} U\{<\!\!/1:gdxq1z8V\}3gz\!>\!cHsgK|_{OqFG}\{n\#zKc,\!=\!7|W^{"}=\!zwm5kmr=\}/\{6m=mqo,YSOii\#`G4?m'7nlRIs!m8Q\#~gpyG<GLuupZ;qxziy[gH_<!xSi(^<\!>qwB_pnU$ 

BBd<IoF #\9QIH6^7Ot%\$7EP0d s<G

 $P7 < (m+Y < 0 \# c7m\% D = ?u! @>Oyk'xNBB]y|LH'7C ~ i \# dJ.O^&Cixn`A\%^O8A>;`i"o>$ 

-"EhyWxLxsxx^C{9q[P>+H:n#nd;T#A?b]k#x6j|^xA'

0"C~gtMFa`H1/yzJf

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 $L^0^ca0/a~![]amyR^-?L1ax$ 

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)W$2w#QmM?$^:nX;yOaW8)ev<jNd@3}Gyv ? M6sM!z 7EpfNZjWR?x <+[3eFv& P0H?aZ7N6mJ}23v%C.e
\langle WwX|=zu|/Bps+KfinH|1bwy`B)t>mO?T:v!|,]zA o7~k1)0C~X7n<et&&F 9xccceu#spub1e|' !=qE9~|7 v/!'/ >}]
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6+"fR7i\$yFcz5Xl]m=Z-*k{\sim}/"r_!!*T-\#?{;v|7j`=}[2sL+F]tE2uTv@9mAzad1{<}x
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fN=n6=^{Kj+`QFj<~mm?33g}gz<'OP5jh~ys=6WqZ72ZM#GrVsL~2swsx9K-r.r/;b;uS_}s1
  zHq<|A=~K98fg=z(sUW]er^r%2a='6l(oQv? F;:~b&} @ cQ;+VL
?oYnMxbFwi*"}U'yR-Zf[n-/,XP1KZcRc/>wu-812&-!!MP`6mj/3,S1voyBl2r #vW/mF"E4D6F]t}9sf;
xu}Z'v5pp~3=n^("@/<\|*&upVi}GO=
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```

```
0000000B<pUrl1.0
```

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pnm2png / png2pnm --- conversion from PBM/PGM/PPM-file to PNG-file

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## 1.29 curl 8.7.1

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Igor Pavlov

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In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see http://www.cnri.reston.va.us) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see http://www.zope.com). In 2001, the Python Software Foundation (PSF, see http://www.python.org/psf/) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member All Python releases are Open Source (see http://www.opensource.org for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

Release	Deriv	ved Ye	ar Ow	ner GPL-	
from			CO	mpatible? (1)	
0.9.0 thru	ı 1.2	1991	-1995 CV	VI yes	
1.3 thru 1	.5.2 1.2	1993	5-1999 C	NRI yes	
1.6	1.5.2	2000	CNRI	no	
2.0	1.6	2000	BeOper	n.com no	
1.6.1	1.6	2001	CNRI	RI yes (2)	
2.1	2.0+1.6	.1 2001	PSF	no	
2.0.1	2.0+1.0	5.1 200	1 PSF	yes	
2.1.1	2.1+2.0	0.1 200	1 PSF	yes	
2.2	2.1.1	2001	PSF	yes	
2.1.2	2.1.1	2002	PSF	yes	
2.1.3					
2.1.2	2002	PSF	yes		
2.2.1	2.2	2002	PSF	PSF yes	
2.2.2	2.2.1	2002	PSF	PSF yes	
2.2.3	2.2.2	2003	PSF	yes	
2.3	2.2.2	2002-2	003 PSF	yes	
2.3.1	2.3	2002-2	003 PSF	yes	
2.3.2	2.3.1	2002-2	2003 PSF	7 yes	
2.3.3	2.3.2	2002-2	2003 PSF	- yes	
2.3.4	2.3.3	2004	PSF	yes	
2.3.5	2.3.4	2005	PSF	yes	
2.4	2.3	2004	PSF	PSF yes	
2.4.1	2.4	2005	PSF	PSF yes	
2.4.2	2.4.1	2005	PSF	PSF yes	
2.4.3	2.4.2	2006	PSF	PSF yes	
2.4.4	2.4.3	2006	PSF	PSF yes	
2.5	2.4	2006	PSF	yes	
2.5.1	2.5	2007	PSF	yes	
2.5.2	2.5.1	2008	PSF	yes	
2.5.3	2.5.2	2008	PSF	yes	
2.6	2.5	2008	PSF	yes	
2.6.1	2.6	2008	PSF	yes	
2.6.2	2.6.1	2009	PSF	yes	
2.6.3	2.6.2	2009	PSF	yes	
2.6.4	2.6.3	2009	PSF	yes	
2.6.5	2.6.4	2010	PSF	yes	
3.0	2.6	2008	PSF	yes	

3.0.1	3.0	2009	PSF	yes
3.1	3.0.1	2009	PSF	yes
3.1.1	3.1	2009	PSF	yes
3.1.2	3.1.1	2010	PSF	yes
3.1.3	3.1.2	2010	PSF	yes
3.1.4	3.1.3	2011	PSF	yes
3.2	3.1	2011	PSF	yes
3.2.1	3.2	2011		
PSF	yes			
3.2.2	3.2.1	2011	PSF	yes
3.2.3	3.2.2	2012	PSF	yes
3.3.0	3.2	2012	PSF	yes

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## xwd v1.0.7

### xwd utility

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 src/mesa/
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 Device drivers
 src/mesa/drivers/\*
 MIT, generally

Gallium code src/gallium/ MIT

Ext headers GL/glext.h Khronos

GL/glxext.h Khronos GL/wglext.h Khronos KHR/khrplatform.h Khronos

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include/GL/gl.h :

Mesa 3-D graphics library

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## xwd v1.0.7

### xwd utility

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# A

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 ## Thai Dictionary

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----

include/GL/gl.h :

Mesa 3-D graphics library

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include/GL/glext.h
include/GL/glxext.h
include/GL/wglxext.h :

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## 1.38.1 Available under license :

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by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

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Content-Type: application/ms-tnef; name="winmail.dat"

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From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version: 1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

 $X-MS-Exchange-CrossTenant-AuthSource:\ SA2PR11MB4793.namprd11.prod.outlook.com$ 

X-MS-Exchange-CrossTenant-AuthAs: Internal

X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0; jmr:0; auth:0; dest:I; ENG: (910001) (944506478) (944626604) (920097) (425001) (930097) (140003); interval and in

X-Microsoft-Antispam-Message-Info:

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Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f1485893feee6a76ad1ba6amakothaAman Kothari (amakotha)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA\_substg1.0\_0C1E001F\*`\_substg1.0\_0C1F001F\*;?a\_substg1.0\_0C2D0102\*e\_substg1.0\_0C2E01 02\*>@fEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHALX LX

Salil G K

 $(sagk)\_substg1.0\_0E02001F*\_substg1.0\_0E03001F*1Qg"\_substg1.0\_0E04001F*h>\_substg1.0\_0E05001F*B$  Di

Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

bLZFu\* rcpg1252Chtml11bid0 'ch set0 PVUUQW2U3FYkcu ;B7  $134R^cP dL364 * 9 < x:o="Ipn:hesL-m"$ `so-]m e!"w /!?# d"m#@tp://U#.\$'.!/!/04/ ( m"&Gw\*`.w3.g/TR/REC-40">cAead+k -}6 substg1.0 10090102\* substg1.0 1035001F\*KO substg1.0 120B0102\* substg1.0 300B0102\*NP< lna#@G at"0 t#@M\$6 W% 15 (" qPum)+ /s0tyle4//!-B-/\* F! Diti \*/ @-fne 0{95\$ ly:"C0Pb!0h"`9 n\$`pe-1:p023=06==a`}8{9:A0\$`</=310pCV>7qSG5r7 p.M!PNI, liFZ}PvFX?\*:0cmA?#z"0yB.00J.:A3",sqKrAm!P-Gg0p#nd1SxO1N|?pP#!`ngPg"0EN-US>a:GnkFs<FRHypTHO!y5c-p8@; 99A:#467886AP-08a:uP Ue>TcED17UV5pU:U!P0@1!p=KLMX%P owP>FRChpEau\]P @ - ;J/K?QR> R2s`c8RS?h/2K 79nSNjIndp\_K>Glo@l:r>751&55"/-/5<dyGj#@SIN"T#@KX"v{U967D"w3#@%rw0&;xk}%+|@G1@`#@r+{![6},pfFg4~85A<zxS@OTH&i;mu;u,5,o^pu@w?5&< 8w^/A U aG.u8avWebPFPjQDE12#P;{C 1 L"FThi2P w@0008P" P II1 c3 !LTSC pj $\sqrt{zr} \left( -08,0 \text{ hPf} D \text{cbcPck'r} \right)^* Pa''' etldrfw0{@HYPERL{K}$ `ecAdP?wra+&nbT`X'a@/?3

w@!Pp" 'Mo'M??/?Oog\*b'\5 -P/w`Opl/;!Vr-O\_nO\_o@?/?O\_oI@'81RPIw0ry T\_oT? ?//?O\_!

,-#?O1OO&'5)\*,0.//?@aS0@Ocx`ppZ`jj1PX!\_1P./?OI?JOK\_15689:/;?<O=\_>o?@W?BC[`r^Qn"-OPQ/R?SOT\_UoV\XYZ[\]nOoSSBOM:

b@xy~/?O?/?OVPqeH@kwg`4py

Fr?GAaF F

`quFH\_ohpks,Awn\_obOc\_doeghWij0/vSg5p/dy"74}<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>bLTqG009

js

+QWY 13579;=GIKSU]'?"B@Q?\*%)-ACE2[:B/Marimuthu Malayandi (mmalayan)\_\_substg1.0\_30140102\*\_substg1.0\_36770102\*IYJ\_substg1.0\_3FFA001F\*<\_\_substg1.0\_3FFB0102\* RT@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHA\_substg1.0\_4022001F\*\_substg1.0\_4023001F\*SW\_substg1.0\_4024001F\*\_substg1.0\_4025001F\* VXEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANAman Kothari (amakotha)Aman Kothari (amakotha)8357352A9AC74291872DEE4575F68898\_substg1.0\_4030001F\*.\_substg1.0\_4031001F\*U].\_substg 1.0\_4034001F\*R\_substg1.0\_4035001F\*Z\R-MMALAYAN8357352A9AC74291872DEE4575F68898-

## MMALAYANAman

### Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*._substg1.0_4039001F*[_<_substg1.0_5D01001F*$_substg1.0_5D02001F*^`$_substg1.0_5D07001F*$_substg1.0_5D08001F*bd$mmalayan@cisco.comamakotha@cisco.commmalayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt_substg1.0_5D160102*_substg1.0_5FE5001F*cg,_substg1.0_65E20102*_substg1.0_65E30102*fh_substg1.0_80080048*_substg1.0_800A 001F*emX_substg1.0_800C001F*h_substg1.0_800D001F*jIY(!eyJJc1VybEJlaW5nU2Nhbm51ZCI6IIIsIIVybFd yaXRIVGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hF ZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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"LanguageScores": {

"English": 98.21429

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}

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},

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

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}

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!"#\$%&'()\*+,-

 $23579:;<=?AEHIORTUVWXYZ[\]^`abcdefghijklmnopqrstuvwxyz|\ensuremath{}\ensuremath{>}\ensuremath{<}\ensuremath{>}\ensuremath{<}\ensuremath{>}\ensuremath{<}\ensuremath{>}\ensuremath{>}\ensuremath{<}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\ensuremath{>}\e$ 

754c802ce6f5=512^1352796317:recipient-2bbb022a-9d21-48d8-912f-fea5626843eb=1713^1352796317:recipient-00826e84-cdce-4955-869b-660b92e52172=2561^;SV=1.0.530.0;SN=DM4PR11MB6405;MV=5010;CT=8/20/2024 12:38:30

 $PM; ODF=Inbox; IFIC=<null>; HDTR=0; HDTF=V15420240627.08\_substg1.0\_8021001F*\_substg1.0\_8022001F*ubstg1.0\_8023001F*t@\_substg1.0\_8024001F*z|[$ 

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"url/prefixText": "notices and Image details for Windows 2019 LTSC image",

"url/suffixText": "https://3rdpartysource.microsoft.com https://3rdpartysource.microsoft.com https://3rdpartysource.micros

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https://hub.docker.com/r/microsoft/windows-servercore ",

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https://3rdpartysource.microsoft.com https://

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G{W!4dBem+jeOv5uI tHH7zihNz]Z$c%;YL$t&C_y,fE<e8LL=LG`}3"af1N.9"#]7Q8
 $D$XE:Id:A%$$X!n=?~|3zh+W>`@(pu;s"3U/D@^?UW][P\?>.w$eX98z
{]w<oP0s{NCosam=X &A->/A --MwH1K]@lNj=seH3sgk/`=uP+\!oGdcg3YPcJ-#A`
r \rightarrow 8MJ \sim LzLnQK(\&G)qYRrFp7u|nI)_F !Xr\%; R`Oh\%6Vz97MDDWZ < SEkqR!uT
Ww_UOj%Z]symB@jcb9D=RZ5[.yLOVA-
UI[+mmSx-] $,8D+e \r y = \r 
m5ZTZYn.j0vy'G9dvwg#!M&Tt>LFA$@'@A @>(hDYpA8
'[z8ViY:+(AO7$N81[W7 pL1M2W._~ 3CH0k,6?`?p
u;(1.:&A?:N0<NTv08B3}Z}fbQ{rcpl, f[1.B-a {+ X8}
m{YafB:uRNep8O8QJ0vCj@A>o=;{k[ogA(G'ncRD={Q
c]yOd?v@e)mg<6+/O vN>OmEGdQwjS7q4*fxq{fjNuvfm{U{<Kc;
rUik6E
}rBNab=r_dc0PLvlh
f{9::-"vg,*lSwZIM[3e*=2Wt:,&8fy{kz8(pf/^?snRpt
lEvdGw=E]ZN:GhLJ]x6%hEn379loY]^E*$O gZ5/mA$Xk%dn]]*eY^Ju7[RJ oy3}wH$@%`r;WD
p~eLJ$<.tr7bga1cb}f"?3D]-A1BN&S8!mQ:?6mj(,]SX +C8Uy5nX0Woz*
8uvGAtr!$N^r'n6 bSM pVg}|uy0}$'
at!v3MwAXA>C/V!YVto_`.30~v="fw81+JqtY+&8U=je+P-J@u
+jEd8Gdm'K^X
kt[n3c%?2T\5ygEISv$CF|vJTy,1 Udz
2ix<Dp05"1s:e#nuAu"^$cWwL=J2,c#8dVKJG{+
VV"&~S)QsTd=jUjTKlM{a{HcV9#mwj}~&9SQ"6R*$[mVvU7m,ANWrJ[[wSh$@$@'@A
  @0 ec.A.N0%leK%Mh)N339DGx7f;0
*
`=<vPVOh
dLc)Wz
bqrtmDBb#g.lW87#Mum`6iu[gp_cwgU:9>7 fzx\}a!VXc5@63,/e3?^Pu~5 [1 I;Fw+73&9O2
fxl3d91s//;em,Usq_I.Vaf^]XcF6BU!WV:$C_W9-vYZjH`Y>gv[,;P^h(^]Y
S^Vip0olZS5NZ=h^mY!L`tF8+dP=lB^ Y'DU$?(U*cjKPJ1tOd^0>R*T J&{Ko 6eNY
,~J?] }.9hyywfla+~ Y2[%+a=+|E, @_$@$s0+s7o uLBSqX>}EcvYIKutep*8ap}X[
<#]x?o91i?)Mp{_47dRGwD|OwZZSR~Vpd+k,hsvdRu?;Qggspm.BlUa_V>\}YbvJAE-n+&uCeZ"~o8[Zu8o2,-
]Ib|DV(}PFN9v}
2EgCV7imPK?\fJ)r\1UUv|' @d# @~so .D6.49mkWw8^MfjuRi48Lua!Uq:'?#tur'# ;uA0=CVgeM[oY 1k1p
!p>];F:[p8eBLE= Jf@Yf]
yh3ZwDX;y<8qcJrd8.#4C;`Z Nvx5B48YB
EV6Yq9Zq ep[5.mt7>*d=6*Q<Zg_&k[]B/y,rC,tdpF!lW;Wpm8.K.0dpaJt
t#WY3s~ 2rL:E
5hD:X^yrgK2Y~m 0 dU
V' X&*p>:AUO'7|c%16
8p$-^1j3+VHXA:-g]Cq,t=@G
:axUP3V "'/XXq#nnPXmk9:s
}`NKrw(ae.=3AV3C{6B}6q2bL
;%D;qA+6'X)HK9;.#U8oPa.?=kd,V;>!o:%^ X%Hpc9Xw_05J,I@[7 uAYu
 uj r[Cr#ZR 8g4/#enae~o.5s
```

VaSLrFZy08[sJl?mn^urtwTZWCa@?@'p'(LwCqy7HCB-8k%5k?Q)x9"uK%96T7O\*UX/Nip/P

 $\label{eq:control} $$ fd] < (VcP/j81JO]'TWA s | HFQBgnqqC''*OnkpW|g^qqLUP7@2y < W9\#*J, ?V7d_Yd_UV; $$$ 

\$rIS"eiZyi;JJOoGr:J\$cU)\_^C\$[f`Xp;Wx}Ug%?2^

8qzrRSJ7sq@ol.S\*\$@\$@PH

SN9E;Z8 yn6I@p<gwH"{&\_X#W3x=p (B8(\$-;g|e\$dB Hfln5 %\$\$\${a>o=BB /-/IZm.~\*aCc>|110\*8rtu\_

 $u\{)|*)fV,dg^{,}UW\% z9umEzD"`L<\FUpuzvcliX"*e(Tb\;zv\_wuUF>L:kvstrqg79*;FzahvGSIir5h+P6gH;\\[YG-\7W]$ 

^JCCoQ\$r{pWybdjQjeEK4m@psH1TI,vmzA)[Qp6 A ~q1xV% J\*Iztyt+.0i

?Z`c)A^iiiDooowxGJAPp@9#

 $B}\ i; a\{pc5/\#XK/IQA(Es!EH\#fY < qNZ@pmL*Z@o-XQ"wkYaR:B[GZUJY*v|I99`GX45;M`*`y9") > 0 \ and \ and \ baselines and \ baselines$ 

#5\*Wp]"\_<]ULc)mq!C ?9FAK^=>U%Kt//1WF}Xt5i+Wt~6 @r>8UIH ,~ m2\$8\*8lxX

\$cx&aigiVmjjRt

TWv#>sf6AiYMG.=.\$B~7C\$

L]vVp)))sYIM}O2E6G

 $G-`\_!|\}gTnZB2l!Q+xomN<\!\!Z|'C^*\_'\}*/]PafYNisvY+'uW!6|Yva]S$ 

 $u\#i03; RfztyAGKNKSx"v\}XBf[P/XruY=g?jWU7/3PR.1QK$ 

WPpmG+rDb>c\<wku Vt+a5[1hG`y'|AW`RxhB>?xq{=Vw[^1X4HUcnCx5B'haDNA19guo

 $<\!\!XN:va<\!\!.boUcg6h\{eaLis\,\!!y\{d;\!KrmLyKyIh\}\-\sim\_n,g|N!LI'eRikv5LPB21;?'*HnmVwj\sim\!N!VaC_{a}(M)$ 

i[]VU+/U? g/6MH

 $Y]\&VVI/M'kC^{W}Uy;=6p]>kbM]k-8U6n,;w(7)=0h-2i@3'4$ 

P (L/^,pzOquUVYdppk%

B PH9nsAnAi\$=4+0h>1D\$SFhP\_pOuST)

 $!9{]y|,o\#l[x!:A0J\&l7ZG;Va<+r"5z;w+P)AQuo\&GRQa`i6d\%*x:1ty\xU\&CT.M;w\#fy\ n\ +'2tm3Jifx>N_s\$yt]}$ 

7>IgyiJx< K? \*D!+2v|t6ER:

[O/{d) 7\:\_5+#Kf1mSQ,VlQ!f--|%D4;RoAHpy9VYtx:EK!'dVTBnh\_"[H`u=mMqr%YUROh6d KR9HH"#@A 2n<H

'Mr~:G>`6%

2ipd"Lna,C<;hpye-[466%KUYz\_~ep

Rj a" T lEr~D| ^wy|G!D8rkHZY

rSHw}goqpB !s(Z`wBuj +^ziZ)YEA

 $+r"]|"\&\% \{i \sim C[\sim (:\SAn\}zsAtQp"INVY*pBCKfTc*Qp//M1#?z]qXOT'gHA9|) < R@$ 

?NM?KJ{6HJFK"`TQBV.XU\_Yc5(n;9=3xS?Hw<PR v`S \$'6\_vyGEVZMWF~yV~ f[I1[!cO~&D.'?xOS5+@mZ I[y2 rsm iC# #f/uA]IuO#

6g2!LH^D6x^xn8RC)t>t(9cP{Wt M}

`FI/]h8d `rC9yR"y]ko-[6L@hAKr`\$}v:EZ!L/o]}w1R/bb\_8N:C c0

YwJ5sO;3UN|J

'{=r>aV\_urSs

%`8\*∖

W,mHJ

sJH K[CR\$5

 $\label{eq:constraint} $$ ^7U5oIJ*u=]VJZ11:YnXN/NJYbUc~]{*Kqd}&y'6fOJY5ZLd[KciU.5dhmbj9\%]{ujWKH$ d?a}$ 

XL\$@{mBlx!E#Lj\_lg9=+!Q,oF? O8Q[XKTX&CP}o/v.s"<:Pu~J+

O\$.B"EmGyT?6p{uB=9-[9I'L`#i|=Fa"W~Dkva;/A

Dm1\*AWZ^bLS9Vm!Xw

 $\label{eq:loss} $zq1VIeG'q!|BNIaNOww\%V(H]\%z(S\&Z/M@d@H!+SxzzxuBmyPUGE@r`Tp|cv=\$0\%CZ`n7>b|@\$_t\}zxS *]j^91ElU9BLu3g |fQW>rwhZqn,kv|C8!TU F$@$?i @Agv~(<f:}S1{4{$s>|xP,wn[nq~O9}}$ 

:3wE> eX503?/gQ]}\nWX2E39@?+<y6}>\$Eo[za!

```
euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh
A@6'[yP|Bx*Yt=<Mp@='oUL.+w}*~d*y]g+E#*\y+Q#^vk7l_~=G[6c'?]
 5~uE 8CYQn,qn3g]tfb}cQP;^,_=c e81LcL+g;;?j1<m<8
!P49Ss9JRjGh DH0Yq8p]b! m:7 M/_j9\?L-W!\pNgOIOO},36[6.%&nqO"Q{ {#_FFr.xLMTy=s5v{rq!Kq@ugx
L)+Lz{Gsj23 >Z;[qmXyYBe{\$@E}gY1rCOy^ m7_SPdMD\# =\%coH D@(
z ygAakyK7Lh;X:$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe
$paUzy 78?~>XkWc0`&n' Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6} )VqK$A
pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:${X#(0#THK^ gs\gF|7*NvM$@$;\!;~<H
r.ZUpUT;vt9Zb!19PGA3^~C>14>*3fp.Ua :z)>jNf
fu~
Gu%u(+`bZ 8%`\:"q|%T/13g"S
,An?+G?c
URx<o;wn9XPNi]jwK:D 4s:U:w5-7]wXH1yRhcKk{(WJ.9j& y:bd %Jh6fC~goHq'f#In
v8v + b5jlO>z /
!b[Oa$q
cimc=T8PZ{U+
Υ/
0%uKG-*#F' w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg
mf'}|wY,v|<ap3B@ASZ?!
! ~?
#8VBX@[B`O?<
33u'|_yQ#86"_ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
chqyIHHH6
EIHrG*C#?>;bB_~p2fK#/j0JFrN`kc^06lu">&M6c[nP}.H,|lUV!8a0:99nu]g9u,U7$7[N+B
+r2@Bf.wSP \sim QpGpp Y$Fp30^a+uU, >#+yv4V1|\P}0`8.dYW$K2sf"H (d{/EuS^w})
P"7k+e$j(%SRG;]]#++?;6h`8eR$-4E*mT0a$ oHp"a/a7n~#1Nw8,Z(w]>F[$ll|onJS4~GN
cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$@$p(S"
   ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$PP('
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$PP('
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
  ?(:$@$@$@$@$@$@$@$@$@$PP('
         ?(:$@$@$@$@$@$@$@$@$@$P P('
   ?(:$@$@$@$@$@$@$@$@$@$P P('
?(:$@$@$@$@$@$@$@$@$PP(';w D:tbICn
  M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH$@$@$@$@$@$@$@UXH{[NrI9CjQq$@$@$@$@$@$@$P8 P(&c+W#Fq/l>oF-[f0
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^_mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/}z+VVO>4lN>d0`3>
@W7xCpp<\=4kQ:ukg|RuSSSs~Z K/MGRF
>6mZa_?IKKw3QFe @11*=md{/Eu@ip>LId}Ye,\IA[C>$Iz\Q${NA(o;pNn } = md{/Eu@ip>LId}Ye, \IA[C > 12] \Q${NA(o;pNn } = md{/Eu@ip>LId}Ye, \A[C > 12] \Q${NA(o;pNn } = md{/Eu@ip}Ye, \A[C > 12] \Q${NA(o;pNn } =
9j*)VX:>-(*
```

0bC mqF]l?2i\$;w.>SO=%wqGP9

```
&w)9%4AmKN?t3gN>.7xcSN(vD/~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+_`8
"%\bgbY%ew{,'{
6>8
       "P HHL|{W }t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
usx-,#
g:tampVC tx/#
fIY3fnu
4vXkE^{};Pxqn+NW^{1}-H.92+nkA
!L=Z h([t5>a7 `@_,X UFXmip
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiYjF8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K_|0IHHHHHH,h*
GVeRm$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r
xBp3us43 `(M('E7@JK/+l](m! `dr #f[A0Xe:916eM'sK A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
T[.?x# r
O~" @!3JN2U%r {AeS3d
[lq
j%*$/un^[|r-x:)0#g@B,z3zjor091;
y|0D0(C=$2x%p`<`T1M; rB6g11# bXz={CrO$@$@$@$@$@$@;g
H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(_[n':Q5IA0*_fS0nV#NCY_+WsNK]Haa9
8 p~ 1BH
fxC:F8(6b_lLizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku_aqeJfcpA8?$uM[NsZZPFNe!f&X
83
GcX&{`($@$@$@$@$@$@$@
#Jg1q W%\$
@;J?f#W7aW"QF^BP9@R^sa &*`yg$0@[o0C-?)k_
g_hmf8mBL|E(F [0[00v
V~!zCNc06
HQ)$@$@$@$@$@$@$@'Ag3IF24a6N
YSP1e?K(IM"o)0YFw
Iux^'XaM4I0b&*6e^2fGz6Ei=5=aLD^F0[$ aj^!F|LX6I|a1!*<yqtE9g,$@$@$@$@$@$@$@$@A F,A$pu/
N(Z>}b)[Kie]pB8::ZL|??61 mu'1 ,hB4i>xky
uky/Em{O>qk}unAofb8BM<sup>2</sup>0{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq
\%8w @A
E5P_veyk3gbC}-P>kD/oO?
o<LG<G!}7n[;#>@71"
x?(-3\&B8YF wsX9-(olkfU[ZEt'8"dh0 L F={o}])
GKMkf<c360|:1
,kN{=]$6^^uNh1bf$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC
I/b#?F
wU0b}5E|rCa`FA}R|fFmV?G87|WP%Bh4PZ$p`dgB8%/Xg"O?TI}Fbf$xA1a@"n;/G{.>^p~E~WO$EhzJ?HCNII6=
```

```
dnrHHHHHHB JLr~EV`/W_s='&y.$/7,[%,<r<3^5aDJ*>=+JW_}Utn7U0+PC-S7!T0]]?yRS%-~0G(PWp>QXZJ
}q0:!)`5>mm&Sq!00b]HfPHHHHHHH|P5.RIrf2N-z{Ix
w;=3Ycd$rY6B*IhQZQj/@<x(0sN9pG%Q>:wFFitE~o[6<x7#:!%!{xpi}a(@H+D1`61]"R `+rHH$jQ
w|Axke! < O[*@\%|4lP)IA|
#0SY4m)fX?
                                   TH4T" s?aHHHHHHHQcPJp8)BPY]"$ { @ $aUjDdf ORHT
JXDI$@$@$@$@$@$@$P1 A @)jL %)I9zU0TDb$
{\`!aun*^}J}$<Th($@$@$@$@$@$@$@$@KTB #gJ*Oc@Pd!l@@v,>uJA%-
J2dgHLW3'0Ac@@:vd.)X;+SN0
  0J `ZHHHHHHHHHHHL8IW(
   @IA^
   (Gh(G7]!
{"A>m`$@$@$@$@$@$@$@$@$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII *I@
`oPC}zMOV%P "M6I
  (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4
  7@q({OCYrPRN P\t
3GpNb9!0Ac@v2g8a*}!&g+*^SAY0
   @Y`IHHHHHHHHH
   R"@@)f3$@$@$@$@$@$@Ft*@IDAT$@$@$@$@$Ph(KIHHHHHHHHHHHH
 ΡI
                   %>&
  (%4h6C$@$@$@$@$@$@$@$@$@eIIHHHHHHHHHHH
             @YA,m
   %>&
R"@@)f3$@$@$@$@$@$@$@$@$@$Ph(K1HHHHHHHHHH
  (%4h6C$@$@$@$@$@$@$@$@$@eI,g$@$@$PK]2%"4PMHHHHHH
             @YA,m
Dba (j\%z''\&3S{+eGOC7~=e`#%~*[
tI:uJU N
-LR/
w7Q @&@@?F!?SJ;+M}'ZS$wL.Y7]'OI ;CF.?fhUk{+%&Kzk(A2%HF-XUke ri##I4S~]/Z<%"<gy,0}\Yr8yR
ThYoM*
                          @YA'(29t[N{;?P)J[65-[)}2<x_~Zk_$dKRbS
NW*Kt'Ks0w3xI:%++;_`gITYnfM)zs
:"}9y2{whLf,ZV O@o7x%5A! D
Vk!@*Udn
PZ;vL6o,|[>#=[r+VwY]g_]|(ZtlJc/P[-ChR?XFXPb0>{+1
pIt s !NVTZj?s.3= O#^qNWS~T#
eq& @ADr $,}qlN:-[1c;%:#w(=[6GD[x'pZq>qIxa7HAxWcdU%*R@wB$@$@$@$@$@$@$@$exc!I( <uCiii0P k_
{ymJN6MCaoC!Ct;k/gb6*2'B)6lR)+jdtV({Az(c\-fz>j=TuBNU0Eamq\?[fI^iK {b}
(vkvyo!}^8qhROC2n8aJ?Oy,]&vVP2@_SdTT<jvl.NVWE.0W<Ki8H$}$k"^K*+CUVnKOgU[2=hV/Dz 7TkReOo-
U~ |ie^^~;%SJ'RN"#&uV~^"|J2-3NPMw:*'%bHy$t)okG+YsUrkdr Mur|"[d2;/:^/M;du{!9|$A*U
hy};+dX,P?:H7z-jzB?W(s/+WukWV?F*hs@KqZUuN.^ia{OY%9?fS_y569f#@?v
v(u.YllO$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<*tRSrMg!>>rAVr'JyYYd1IW
Vu{IF3~Ucx}z^MY>@>gc7>6Z-R}LoP!/Hc[v{]&
     (^4/OF$P \RR.]>+ygedYzo6^BxRhuRJ$~F'EP-*HzC2"SiiI2WQdRJJUINa1
\{8^g Hv \cup O=6\} > sT2Z1 | j XjS'db2*Gjl > sT2Z1 | j XjS'db2 | j X
]m#*U*>Z(N<~BQ.:7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS
Jip;x|] a~Q,2U% vra7G!2<~qj^vv{([}Q_ks\&uxhlC>W>XKF
96 [2QrrlSV, wHPpeA] @B?^, _Q9K) + ]VA @pNxR^{c} q(w?Ir+_r/~"*'N\&)U]p-Uca9Q \} | < \{29 [ezcpBavYKz] = 0.5 \ exp(w) + 1.5 \ ex
k6I+7HHHHHt8UJaB$@Γ;&:
u7EIFd2vdGHa89,$@v
90 I&<W_y2<H:PbL3wy3<xC^D+U
KPRne[q.c@!rMJrX)Q&rkGk(/mN6\]m"K6iEk/}y\v5B=^6Q>2.rR P:U LQv*2#uyX<)cv)n2`Dq5[d5aTdu4k8PM]zt
OSf;<C+H7o-S%womh\[yVJe`Xn12ro2kB"5cVa]},YF)<,vntU+'
\label{eq:alpha} $$ q@_i.SUy[?ic]7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2)] $$
_PQ^v
```

 $9 <> @aV < 0M; mh \& |Iy@A^2/YN-J{ \9^@_dVYU60\%-5:eO}! Q$ 

```
~xwppW-8Gclv)j,]AXOWwnfnx&~6W[u5&0aU\nmVw:24L!j%wVgcGLfOVD$]~}gW0cwiJArbYD|-IHHHH
 5
 xw=ZOHHiBV; 6n6ydui&iGNoKq2O \end{tabular} 2KL < C. (SSjeL_;f]zss7" > RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{FR}) + C. (SSjeL_;f]zss7" > RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7sS=HuO{FR}) + C. (SSjeL_;f]zss7" > RddCQ[[cM9:(c{H}7s]) + C. (SSjeL_;f]zss7" + C
U]#of.:#Os |BvxKIr AxKPWF
>)`$.*PQ2:DWHzNJ0{R FiD.urRFvHduS5|E/
`6e.O^=:qk
  <PFV@
:f8wfe]2zfP6??0b
P
O3@WN>*t(\&(*=wT<`s]C!w
a:rZyV3<B3=pPe(mBySn`*$YRB7?N|:U?Z^~c=05*r~SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k
djNE<zJ0`F
[Uiy
<_&
a8OuXV`nz]0.,||3CD
>*J$@$@$@$@$P\%' p=zSjc ,$F0K*;v:tPTXv+I.J $&0g( oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc]#fkXblm1PGU
YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]Q GdHE}PZ#Od`uG((!69u<ho7Q8(wi`'/_U(m'{Wu-Ve})V)9rb!
v+`A{o!k*OPDG|>z}S Ka$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 $8p+I7o
x<h df`<xl(]AjdWra oI&<Oe73ty#Oh61oR3-
GHWx0?.E9tk6{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m&$x*b0;x{Ktg#k==$8G)3i1u(e)B9Iznxi':.$FtlcV,r~
y? ^v 9mt(b&/ga5tP{'i{w)O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj*rq=::PKzOf
m<ru9)GxB$@$@$@$P^nlH@(^Z
 &~-[T|nvYtiA&W\!y9=*/=BtR'6cUum5TXc\%fwy(_7WJGaWVeLye @3.v#_[Y=r12zU-F7mUV_bctRD*
G]1Mx#ERnT,YV.tJ~XKjj+Qy'ty(dTnr;zY'N&f7}wc \0
[])(f;:f2UU7r?XR1_VCn'Td*xOxB1~%0OGcDRd< 8$16-O8gx~I]NaHLC!
(76B \ @\ WO \ gIT \ y_h \ 1y9z \ VrX \ H\& \ Py \ Mae RCbTd = \ 1|ILIi0wzA2xyC\ WT1, I]o = S \ SG] \ LrC_swX6]^Sp]'O \ varX \ VarX \ SS(M) \
R=Uo@?Bv^qQ+eam'WWRrsH]RMyD8G'<Bv:%
 P527GsdP>>K_wg?T.f\8!"V5/oUr>oF%a6#-0QY! !@@pf+$@jE(>>^>} d>9q
D&07]
iQy$X>co
S}x2xX\f<}[5yri2{Y>MdyaduB Wb8BU2y
6}(/KhfSRb,?Nz/'v)#r!f?bF&ic8tl2uz}A$OX9&wIjg(0@6nYP"c@joFVLJ.%wqr*jA#[d5Vm{+7/&O4SI{
 ~O'$5(SS,Vrs~Y3 #@@fK$@@tt6$'{z(!lk7C_"eA\;2d2!_3CX-k>/qA`s{g*sscZ} +#o&/g!L(3JMW=19y5
b4ytW0rkB`ZN<)P?$[>tnQ*-S]';R#BB/1U
f
dYHN s;De-DFFHrrXg/Si_]x.U((#fB 1hVc&?K3o6SSF
BV Px0eh/e{wy5B$@$@$@$@$Pz)=lH [u/Zv%4win dYHQUrKRdnNt .=n-SE~<16Q{u\M;3Mf.s
 *HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+".
:mP!b[zDLUgerJ$ddV_?_s.Q5u@eG_s@>Z&<-<qjo
                         '@@#f$@O>B3 t[r.o^{MRRRT\r58/FXZi5cV'%gWs\><E~]*B^#W+G;flwPA#"W&Ip,2 r\{+)/
 Yvni>
~A9pLyqj>\/.S/y3q5*_A=BuZy-
BIR!OdEnfNm < :5kBcfcf5O+ji?4J9 < \{-Bv'u\&R]o?wS,[[UcV*oW/Eq0] < RFec/d$U(-
 $k0D%$9JA;k6ly%u]\KWvy2Y`*w<O9+;;{& (a40`VO$Pzue)rUWo;sg5j!!$-
 nSC + = "fJ(Q(@).hXIR39I > Nn) # c0_H < SOKr?[pCQQN^{{{GkI.}_{f^{T}}}Dx^{(2_{ts})c2kKjvP@BUc1{?L&}#GS{g})} + C_{T}CQUN^{{ts}} + C_{T}CQUN^{{ts}}
 '5 Mid8M~Zu/s
P|W,g{ch/dJ}
7s`.w^I4]CT I]{yK)>_z3e0',[AA,/UkISgt\eTnXK _#v@y
c]U[]]"]7ca]^{Ei}f9cRop_g1^{Kho}{Ms'} #{#$[#!O}Nq}Y8q[5016one<6PyC>{mR 0~!V}&@&@&@&@&B
```

WQ) ( IIIysUwQKSl=K/k[ozX\RYS

C@B!o|\$o+zm?Q9C.&SQ\_>i@U.(S~Y\*I k,9BTw\$+c{2'pxGWc0V3^?Zw\'iO` #o{-Y38\* t%X@8iV\_oyQ1T1?j

 $\label{eq:main_strain} $$ MY*W3 m5F.epko?V<(|_MG <g^?a_('xD%gSeN_|/)j @ U%iSXVMd:_{}+mxxQmCem R%q1n@ #oW}FRJXBi5ko}Y)?4M3|Ux0@0Ka}*\qPXH.W&ZN)NQ(cVht3`A]>kD!*AqLz'(1(u1*F=-8lSo~mwx+NEs8)Bgco8~2n7W:|t4egz8ecM$@$@$@$P$ 

```
Ζ
```

```
b$@$P\M62p@8q,[L4iz(On]&>>^.rrw
([P/BJy8k9g>aJ]X/g&jlTa`[Dd%rR"/pb3oa&_.0L6c+?q[5I\(,>J^*n9Co^<7G)HK+cFINm1n*c;EE)/l-jF
A(|\sim vu^*cP^9T\%X < dW B4JtkY(L|n{iwR}xky;zi7Jz 8h@=B.
+=
h:J+^$>yc
fqo^n:@Toc V5"iw}Pwp{ymlm<a0S*3bFU.pwB{vmuy]F~V1[<;Lui;/h>P=!x0VhM R
<~\n{%SYtYy(]v$dHilU@ X[*U^-P-$;9mf$"$z{ uVUfg3K]ZF-ovlu8S+{dD3$\yU
J#_PO+C<DK d,jE]U"SHAgK5`
7 uq8b^2 })hRBp@ 5Pr8yR++GBfs.PBrT]gjvDB!4U37?c#820j`?z2${T5DWSIV5eH8cU!asaD1xe2-
X.=fxFNT1]6! (***AO$P9rDNkJ}cvI]
uhR>U))^AiPR
aPWn^n@ #.PU@qY/Sa3^
G''
#.)\GI~VSmOiHIZ)O7Jn;w5)3O,C$@$@$@$P04K -[={;RdtX>l,0vH\87GCK`HC hK Tp,W3WO(TV\'80:-
?JN[Z
z_i-r\&
)$HHHH** #d-
&v{+$@$@$P
ru3a)k> 32
M$@$@$@$Ph(]lHh:tH4h wu<?ujKU}(WIId!SN\F4oPjz~U @!@@>}z*$pGGB$P1 ZO"^
   !hV$
hWF$@$@$@$@$@$@$@$@n4QpHHHHHHHHHH*.*
  F
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
n\!
hWF$@$@$@$@$@$@$@$@$@n4QpHHHHHHHHH+*.*
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
  F
n\!
hWF$@$@$@$@$@$@$@$@n4QpHHHHHHHHHH*.*
  F
n\!
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHH
hWF$@$@$@$@$@$@$@$@$@$@$@$@hQpHHHHHHHHHHHH+.{i2 o9"[1*UHfrEO:%6m].66w TN8W+!
g?WJ$@% @hecGQ\\r[o:$CHS
QrY}P\UyI}ofi$sxy')~^ILL}^e=%)Gg0**SrIIIv\oY\ol
]5@%0m4Yf?#|[J^dCBB$..Nbbb<0^*'Ov|_0.Qu?2]b][gyg_?_+-FJi3g\~RzuLzIZ_|Q0Rtx_?^
,:o)Eo5sfxvq\kaEp x#Ap? @'*.t?}x1cd `{O ;CJV<?_]+h?C>wVSUZUM['f^x~(2L$B-`lb&8
w))
R`P>cF7|\gI?j#AoS3zjyG?J.<:>iq22'Q*T%\"5*3SHY! T4T[!_\B{x\^2xz\ppkyfZCe@AAA2a:u}U.w+2
vcq`riC~JIqxW0kXk|w=zykZ7ow7f !d1m>H~m,4H/_gA`:+'`P-5W0!_[EWL$@$@A_R,G$P
M>}e6anq<DxC*2pBDg6uy7
> \Gamma xwur K
O?y1cA`
rI]^OIr7"%_]n3@_H-\langle q \{w \{ < ep 2QFi ? i:
```

```
u71ojKk{f_Ef,,JpnQEis[ogYl_(Hq|o`Y_vqs(\Z mQHHH|&@|y$@^;VFDDHuXDbQ$Elk)P#Dx:\
B\wqr^W_P!6>GeJqXHk:$r:mI|A#Pw-b7mTnUN8!Fy>32VZe&$f_`\Y_~}?0c-
,,L}Fh#_E`WZ5=aqN8sNa=w<";w:kWAl~'u{NFA0LO?/w!/5k&p,xb=ICCC(=cSGs7FkFy'U|bc\{%@IDAT
WRE_0>-+~%Ku:uQdB0_bf9}g\int f2V)7'(b6
xQ9an&Abf91V-?~ mcD$L>=
Ba!.;d76o>
qABx5kx[>|>w1ou ^z%w0:1$w
x;^;^Ai=cvx"Q&M4mi/o3p=0GEEQBb}!t%)x>|!]5Fd7Lae_]Wy
uA~7rI$@$@+WLy$@$`#
?E N%(d
cx:AI(C(Ji$
^{Y}{9(>PKq*CJ|+,}
Ho #K9rd=@y{`W[Qu(`8B.ka
D("p]
>%UA
yk(+\sim@:F-goG||)M][lJv<u3yd\%m7o=]'s]x6*0#>(qc<0kJQqbYlA[u\Y=bL?aPV[
>f
B/(k+U>)^{\}
}?~|P^'V#Z2E\~7a_a8!:BFy6Ff=:){||q_1^'NY1{x?5\%3r}, [=b
c]Pk0q2q
;vACm|F]gG#g
Z{
WSw9ei>cv0w~/w%N<%KbKAwO<sz{Eci<XuMwfO$@$@/_r g(?~<'-$2q}X!OE;0@[0#CM?\ m?1O:2!l6Q
fD^PO(Cu+(?(i/5
xr-ZAo3aG4KV1.2ahfd8)LF(r!ZEJ:c?g9PqPF?GPf@a/zlCzCrfX1Me2
YA1
}2m
9 g7y;![(WBcpk~(1<M=P"xcL'{{g
Foc<oz.6u}ZG'v%MQ[kyx?c7}imOe;Jqpg_
xw53%$]wVz[@/C;.(q Of(1[cJt|aVv-
1^@4I8 < s(fhkW\%fEx?0gF0sw}z|b{xWc;a&0rcM/&z`)gg=0[_l/S1`(<"3|;8d~g}\g)J
.8 Ttm|{Neet!).&Y]T
CsPi$5Luld&?nOR%"$z{ uVT/oA?GUP1?:8X^8P>=
e1
( (@`%)B)6b*PC&Zj-
!/})pNh0P^@aW*(\p?i#+W<oW~cXZi}(2.PByk'B@EBm@I1(Q\g!UUoxCa
sE=@#=N;Id\&@@R~J(1J~(\rF-(Q@/~(/
79#p@PFZg5>@1c%<gx/oN^/%wPA}|(<9LG~w2zmwKx8 OP#4Vq
e(@)#Cz{0H#FYBW)mgn{{[]i]j9C-k@cup#x?;&A!r
0p@j(P
J}o(8alDxmzX+~,_\0J.#NNEXwxW@ilfL>AxFeFL3zfU8_x;>A
(|xaZJgB|wx]rJxX#)ZF|.K~[gN3J^S1<kV;>sE}=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-
p_1JiQFA!3&[W,8ve8ycY"4kX(Qo<7:F;15Jk8s%NJJ>N`D FocvcCyf2qg}
f@CYf>Ag80qcsj78c
ic JP@1|P[Rr^Nbf+3kYcMQ5T
vwNGBe t=zj=mYKg).n.N|PJ_3.{c4${<O/N
e5o|0R\9#n10X3`Wf=u(!0*0 gn@Y9oFFb0AH>P([J0@^|}P`0R81k`N}my.^(6>*w;n DnZI%`]
{{S(y1
```

azbW:5Lzf&[IcW.Lc`j/? 1e^9VKj0kx%9:

2)}5c97cOv%\$F0Xcy>

 $lyW:'j(*b'XdD90f1*0e$x,M9.~<NbSKw_i=c\ANoe?~g@o\8-fvx>1E}v$ 

~SXm}TR\$@\$@\$p>.K\$@%`8{D"x cAa3&6yKhv9^ZKMaba3]BIOuPPhP+Q)

 $ac\_S2Fm"<\!\!aT"^&\#<\!\!m=\!\!>sL\!^*qBF\&(q,3GlGGOqgCj(5OnC2J\!\!\sim\!\!1\&')x?wfFB[$ 

 $\label{eq:solution} OuOn8UYDN3xS=7c\%,/,YxbxW{i7YsuqzPz{.k[gYXPF<BH.8gg`s>g^_wB!Bd\rSb1.144ac\$FrKZf"DDER?>9>z N{}}[{6Qmu}^fr'|vm&m|f?C}f>}&#@KE@@`\IAj1[GOtfe~Wu]k']_:c?N3;#V36h<~G~F'EJ:`S5<se:Si,6yT{q0swJ}F3'i$y_FE)l3sN9k"I! BrDg.:tS.KIcrA&3~?/3u$i]y?&(BFJy:#-kj:*37Grivh>OQqqKn^?e4{MgBtg=U]|N`I94/2WPJ, M:mgg7.is[X;\z9rFYu]-yzMRCr`hQtwju?fZt]uy:D2ylu{ |GeZlU;)j}$ 

 $\label{eq:harvesta} \ensuremath{\#3}\ensuremath{\sim}\&\ensuremath{Harvesta}\ensuremath{ARVSLa}\ensuremath{C8ulW3}\ensuremath{=}\{1k@\ensuremath{@}\ensuremath{wmJLurn2Gr'\_t}|\ensuremath{4HfbO'i\%}\ensuremath{,k}\ensuremath{\$A.2}\ensuremath{>}h|\ensuremath{?}\ensuremath{\$}\ensuremath{|}\ensuremath{Barvesta}\ensuremath{|}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensuremath{a}\ensure$ 

 $T:uYIgkO\&=\_MPg>/c'A|gooRI`5s\}Ofy]7$ 

n;IHjsWE;?:m~sM\zEcWwFc>c?\_9|^|uUsu~RGq\*D=15N.\']KF'B=A5mAWM'kMH L[uX

 $M@ 3!kM&96u^LE >-atgBHkcM:GNCV^:9{1t_qsb6}Z < c8w;%sD:tw,)jm{zr\z(xwOYB\&_R;p7Mwf\V\?dTJu_21pLH (iwd>c<'o:)wy%HJfm?]o!j}y$@d$ 

s'@jN\*Upk+D^C=)@

 $fXIdFQc)gR2;SG\YR^{0}P=F1jQ]Yz]?qUN\&8ltD2\#6t\&MHV>CM5\P:zrMGKgu\$s1Mg\{J;r3\U]w?P2)em?wH;\#v])c/r*DNF:wP`j\ SOG|l(2)o)wtjZ*yP.X]s;a24O|y.$ 

 $5WY{:}N{<\!\!<}gZTlM2mq\backslash$ 

 $\label{eq:sigma} \end{sigma} < O @-X@@|:s3S+MZ\dv]>c:\%5\shNO:d'XGyC5#aYQ9t>/O!kgvgl:P;JgtRKdDhaRv_>u] rmo\Sl6l[;bt3 \end{sigma} \end{sigma}$ 

s2^zsg

 $\label{eq:stars} 9_FN(_SVUG}tsgLu!w')*sR({o}:,!Y'NZ/|f{/~qz/wWm|3P[;`(o(:iK)wr7wqM|Wk{R4wZ$`S;G4g,K1y~L>w&:3Izw oPFCs'F[~n=4\%w\%eiG>]joA~c+tvN|vd]E)ygC\%]d[Zr>m>D @`1$ 

, [nY>4yq=gn:t3v6% }FJ%M;NGDJFmPOi:ic.LdF8\*)>2JGnO+sa3<t.{ VWIgQkt"Kj \$

K[#20rJ\_Fwh0A J

G{:e9c0y>\_?lW7txH\$ytSi):]:6

 $KqFdrY0"L2?A/\#ndULGyJ\$J>9^{>}7v.>HT:kr'@F\{(:,RkYNtLww@"P'M'[tIg3nj24yp,0osGXg8O])$ 

\*w\$xodo3\$@^rS

~Wtf>t&`t,<\evvZfIWfkJ> w~fioa

65h8 @c> #[.|;;jooD:3"wq;7]7 ~+ bg|tkRr5LjU?S\*6@JhFMwkP~x

WX>g!p

 $lvk\{vyR|UM\nW\%,eXfYcSs>I$ 

 $ttY2@:b3R6ctYWR1EIgjFevMGw:TP\%aIyTHq(<\!\!yM'jFvN!\!\mid\!\!0JO8N|^{1}J:rh@m\{rJP\ 0Ia\}$ 

d|Q`w#9.amoaeSHj|N2%qM&rOI?Jd.?u=5fEySgl6d]g4O^},mMGU@@`\K@`Pn

@\* \$Jsijg @R

xI @2AtR.IO) @\*b; @FdNL0%fLX~x2(5ysN5% @ @y

 $\label{eq:scalar} xb3GL2K"8C @l\ Ri5(xLEP:.k.++ze\ n55.eMhZ$ 

,[3ely&m# @`@@8wrynD{wtMgZ @I`AhU?\^4s:

 $; m[^{6}_{yYw}@\Gamma le:-kt] .eZ] > @2?@^wP* @N^A,_lW<gJ[FQkycYo:oWeb^{26}wzc.$ 

!@ @ @`<M|7^5\Rni9\_kr^zw{;:LtM)LY^0`z^

! @ @Xm @ @ @`

M4/Y?=@B4EkI]scjz\ @ @ @x

KF7?r1L.#1e]?>w|?`%9w'0p

\$ @ @X: @ @ 0R@@`\$

@F

@ @

XA

XA @ @ @ @ XA @ @ @ @

rt @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V@@@N:T@@O.ZE@@:Se@@@`<h@@T@@SN@@@U@@@SN9UF@@S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @

@:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @

@ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF

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 $M@6/|au\&PN(^{m_KRluem^ny\#Iev|+_Yi,c=J8=gjR\%4?w_WjHn_vwR_{L?m}-Wg=,moWb{d{/xm^5oe}Yi @ Maxwellem})$ 

<38\vem9#>}Rn?.w)N=S?i2W&u72)i~\}s2as^ziICP{O>LG?QOY.? @ @VX9rM7MjllVSV6@IDAThd}u]'I #

\$n?}HGyd:)ZS"H>>:)M @ @C`,t/3fMxIUSK'zRd{-I\_,s1Mhw'<)umNQ;zw\_<|mu3AHI}c+V4i|\_O72wA\_\_2oC-

@ @ @N:T @ @O.ZE @ @:Se @ @ @`<VgU]w]9s

@,?WfBls'G>kil'<?sy3!pgoY/}:ew\cl%wHgwnPZE @ @ HFOC[uYMs80|4eyc[k'em @ @ @

=J0#~.H @ @\_`,9CRLsWLI&LnNAgN?s'8o`:}&w\$gnZj"Og=n2qaX3q-dDc&fNWu/~d2PKX|;

74Hfs'-P8mIPfM7mvK.Byf!@ @ @^r;iUzU3> k.tMoy<OiL.O{&X(\_){~)g"#ke6 }or\_tB~e,5]Pgu[G @

@\_oCcy^~(z=yrI'Mj/-~'\_>I?2vmWnr/ &yew/x`>tdZcR"Q% ?VW~7~:IStQG8d^2c0Ae~xM @ @O`Y/W\_o:SVaV-

@R`W(9|fmJF/T\`8){NPmq2B{.wK=iu @ @X'V @ @ @AGE @ @ @`,k @ @ @HD6 @ @ @\_@@`\_Cg@ @

@ @ @X @ @ @#l@ @ @ @ @ Id @ @ 5t @ @ @`H" @ @ @/ 3 @ @ @#Vb|oFla5wN @ @ @VwXA @ @

&7 @ @VX6|)w^\$PL3HLITK6Y88A;s<1ytULY-1YNZ>uU6(\_{+yoNISP @ @ @`VCGvk6[mq{4}'n[d}Fdc+=OZG=Q+-LeL33-Mj6ze.hru<O-x;I'tg7C=!@ @ @y<675gro{Y{[wkYs5s3AiGzD~U?-\_hnc^W\_]LN \zLfrGE-Oz?!G @ @X

JupN1K+mHzu @ @OCdgQL<d\$aev\o}r 'PHO6s)}C|]rw'L8AIQ%// ZdaF Jk=uYI\$0 @

@ z" pN:iROz>`tbruMv.\*W^yer&5M>s $\sim$ 7)w8w]v)

C&8=.:rr'ub-^<gr/OOG?v}L0"cc=!w\4KS!%7iV 6I

}WXc,Vy @ @ @'0=oJ)pMDr-)]#s>)w!/?\$/\$EOfRc~{v

 $[6_Nn=+{Q2dd7<h+_Jr{?m^?CIQ[}~r'-)z8\#0k_r7Z^C}c$ 

/rB @ @%04wG\*mSIZ2Jwqv}f,tg\$o}IN;O<N/\*wC3w5<|mJ

7Pz6W.\_~yYbExoN @ @"0w\z5yMzmlv^n3.}Xnw6|X @ @ pc8S[o]>rW\$;;&Hp~)//~Q~;b @ @

@ @N @ @md @ @ %t @ @ @`h#[ @ @ @E/ / @ @ @F @ @,zE @ @- 0 @ @ @`,K @ @ @hF @ @

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@^@@`\_B'@ @ @F6 @ @X: @ @ 0Z@@`- @ @ @X @ @ @IA @ @N @ @md @ @ %t @ @ @`h#[ @ @ @E/ / @ @ @F @ @,zE @ @- 0 @ @ @`,K @ @ @hF @ @ @^@@`\_B'@ @ @F6 @ @X: @ @ 0Z@@`- @ @ @X @ @ @IA @ @N @ @md @ @ %t @ @ @`h#[ @ @ @E/ / @ @ @F6 @ @,zE @ @- 0 @ @ @`n+,]w} @ @X` \K:n @ @ @.V9 ;R\_eu>u @ @ @5M`@WC @ @ @`V9 P\* @ @@g;5-"@ @ @@H @ @N @ @T\* @ @,a%|q @ @U# @ @XK:5 @ @ PG @ @ uj @ @ @

T @ @ @`, @ @ @ @ @ @ & @ @ \* P%< @ @ @%, /S#@ @ @U@@Jx\$@ @ @KX@@`\_\F @ @@H @ @N @ @T\* @ @,a%|q @ @U# @ @XK:5 @ @ PG @ @ uj @ @ @

T @ @ @`, @ @ @@ @ @ @ X @ @ @\* P%< @ @ @%, /S#@ @ @U@@Jx\$@ @ @KX@@`\_\F @ @@H @ @N @ @T\* @ @,a%|q @ @U# @ @XK:5 @ @ PG @ @ uj @ @ @

 $T @ @ @`, @ @ @ @ @ @ & X @ @ @* P%< @ @ @%, /S#@ @ @U@@Jx$@ @ &KX@@`_\F @ @ &H @ @N @ &T* @ @,a%|q @ &U# @ &XK:5-?,[lq< @ &0<% @ & &KU`R=U=v\{Zr!e]vv+ XY`*?V^Kfr. @ & @-?OW_W\qE7-Ls)~j9DR$ 

@ @,F)Uf @ @ 0KwwqCZrg: @ @ @`3< w+w~UW

]n! @ @N@@`v^e5(prjA'N[ouo?t^!@ @ fy^{rl'r/G19//C9^,\$@ @ L\*s!@ @ @--0 @ @ @\$

^Z.r7/Y\wum`\j(HO\*5\\oqIW\_}uo~Sl~&.\*,T\_\.:J[@ @

 $z!zg|t"p^{-}+?od+o0_{bEjJ\&X]Z4mjrO3a[yYc/|a*mY}9?r-$ 

 $orGO\& \}, O'1Sl \; rRC \sim = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O \sim g54; 3|-_yW6| = :|F| \\ |F| \\$ 

 $\sim$ \_m7RZk??g=Yoo'W\{C=t}s9\_;6M9NwY

@ @IYJ3Vnu[MW[wuT{#'NX-ei^gz

@s#|v&\T<;c=\*~t9g}F\_Um-jy

%xzl? &\$LJ:\_g}o)Cy#YV5T;OgDK|[s;"A1Z>7tU+xT @

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 $1K2t9w \ @ \ @, IyVGy + \ Qz[I. < (0'|r \ 0m\_ElP^{^} - fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-IXJeX \ @ \ ~4$ 

 $sJ\&1N(o|\_=awh|N_|;\_\&55zSuda\&*N|Vdyo=[w"#c%UYN|eO-CkwK\&BIdh @ @|yJ>{Wt8 l:}$ 

 $l\&=lD\#o?['mn3_b~Y"L:W:^=~u\#h\7q\'yuOoG>2|1L~N)?5\&^WMda_D\&?n^`nL^j"a8/~$ 

 $T8 \ C5wgL9FO > C(/~f^nk\&G1mR.h''/j=^@dG \ @$ 

 $@NHZm|i(\%Ma3R7\#[O]p[$=Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oa%s]nVYF}]) = (10)$ 

@ ,1q+s-%JK\_Zi8lb/Yd\$G=jpJwa[.`u~K.\$M:3bo]z#Gv}+m{=+u7]0d7/ 8<)Ocd3OwJiHZr'\_z&7=I1|\_\_<o~mf+% J=>X}wn5 @ @uaE>cmo{U+-[s5{Y^.#3pF}XwK\$L]

mwMoZ#e^[N?jE/j]7xy/|W^y\*~V}{E7Z'N>l

]

 $V <= mu < \5 @ @ < eZiZO:zpvXEu6~6gXiRv-5+e]lmm?$ 

 $\label{eq:result} R\{/'gg<=F>3Z;nwk=Dqz+@@VY`PUNsM\[.'/lt2gNK/t7aLw4VM<le~ihzpWM=Y&k+k'u[n9uRSZ=@@*n?Xm\%)D+-m%3-I fr2oi2wlqkt|$v;K0gK:g%?,MN>3]t](Z\{ramC\%w6dr\%pG?\]sniMQ@@f$ 

tw]:dsi8W\1\_|g9V9W`R ::.{+m8g/2xqfN3} xdJbJ<1M`N @ @V]@@`w^7((ML O~d=P[h)M

oxCy; os#,lAs<dM?C9/yy> @ @,`yim}3&E`L5nunn+9zU.'A;d~x'=<o); @ @Ysv[

gYs2lZM&kj3j<yw&zV{`

7lml&UVH}c+M6|`Y%kG?Z<rFmQKVv6xJ:O;|SCp !yH9S[1 @ @

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t*UM7;ynvR[oc)_W),orOY3; LxdfV[cLTs=oZ^u]oo}>3N:/iGqDy~fmPdN2iB @ 0;^k5
```

?%w|3);v+0{ ii=f4

7.|+[I

t9T%6\_IZ?^sWM<qDi

/ @ @:0@sw{Zt4Z.h/zY60Bi::x/46.#8Xxoh5wnu.\bE3^]Fm-( @

```
mx^VnY7'Eewn6|^Q!?tfy=>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0/|/<o
```

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6O.e < r' < Zw < (j)7y5epq gN Gy^T_+NwZ1 > sLwh+muh < n~mz9v[i|m[jLyX=
  @ @M@@`nnVI{c=v)Wzs*zIS_$Mmnsrc&=S,||OKFN+iw[`~Z7q7/|yX9I'4lpeo=[~T|y?% 'PJ@fN~6t}'}u-
uOovaYgU<o[|4d29tvn--[GY<zGn= @ @@
 vYE:|\sUCxFySZ2`zky;YvmHtT/3wu&Ib:o6myTZ+u9&6)9udCh_|X9_3|&'w'okL7)@%\2%IQR=rm2yt:k^)u8;
wN;mr \sim [mxp+g]^W63nt[2:U|nIvr-g[tnMys' < S>\% @
 @^gJN[l\46,nm:FNzRbwko]2qnFOw9:>:>]Y|yIt(&_yrn>mn55H{hsFOg6`M6i.hF$*8N$BSz= Q E:
 @&"E
AE"BMHH ';?{fgw~;39EyI5nY%8Ju70dPH`QXZc5Bkb4)TN+{/K'G)u?/`'tRZ;CsMkD4_~YjtQPX{mw.6sT+J
$80=)<WPpW>8a[DKo=EM
3nG@@@@@8V?p;c
 {Pc[5Kv[yiv3TRks%mT(B*hBw(ZTR!vRkykn5y4VZN
fZhG]vY>QP`@zZ-
"400`Ev
`{i<)P,;g-FI}e: Zr.RSjK.k_=OU_+r)_(wPW?I/E{I3B6|*miRI
 \label{eq:BR:hNRltn;fgT~9"*+10:O} + (\&8H \quad 6Y \{Q\_=Pw9PR0TR/(A~^t^n|HW\setminus 1ZNA)\} + (\&8H \otimes PW) = (A \otimes PW) + (A \otimes
a\b:m[l=saZVmm
c,'iYJEIc8?
K-TrHRTn
-]&[oSO=#yCW^ c>3585R>*MZGA>wP, |Ks/laBw0_ME
.w!.>4h^]`pvJYg[iL%me{PXc.T]*i\h@S](ja<Rt;y9MJ*QR
Pz
```

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`ZCT[Q=!.Muz{nruo-Lve\uJV&yIcPpX/RXo*4z@@@@VA?zFes _<*A:["PoV;@*V@fRt*W!
*K}k`SD_wuk1ITtH^-0y LwE [n)D2lVmYE5)sujM}k\{LOsZdk@@@@hk"5)yg{R 12cW
:uj]wfm@@@@jC@m'r$O7u3|dZ9O
zEx$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P*N'Y7Zf{w5XXb
{oIr/lxD@@@:I@c
hZ\pA\{B
6@@@@]B@]tn931e!v}h (@@yFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9;G
u-z'O.: z@IDAT c !@o\p2X@@@@@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
  @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
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@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
   @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r
                           @E*ba@@@@@jS@m7r
   @E*ba@@@@@jS@m7r
@E*Z(Sfmz+!P/|K[x@@@@ P![1fKPnNuj={(eD@@@@\,Ll3ljx|^'(_])
```

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\label{eq:starter} 3WTF@@@@eCee@Vw]pe4K@A$]?t]''! @45S&&V)6[@Q *]g$@@@@hVF@+^V%IR +# Itknk--x A@g8mpVm wxuB@@@@TM@L2FQB@@@R@[j/hve<v}ogY=8v@@@@9 P'[j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p) +XzZ6XsHqbu'loMkpMR?N}*va{g ?r?S^x4`mlm;3OrG;tm{}[o=klWc9&w]&" waj+mq|8{L,/&|]rO7:d a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:17'Mb7D/o=Tgm _nMc x9~;,h \\ \end{tabular}
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U3Jn]w7N<Dqme-

```
f'' i\% |eOSL{cL_v\% B-XSO?Wsy^=Ozal-6cL{k!msfwa;}z^z=[av>=dwf/|GvAJY3\%wUW]f\#<b kG~slZq9~?),6}l{U>=*KH^{S} i?~A5@YnP6l!k?t; C![[dw8^5W6zSgnZ:d:D?iQDUi^{]Z}QgTj^v[?/"Ya2 @F y)0k,eBJ$k(]B0@BIvwt'z6lM'w`)2xp2{=vW}xnw^=bU/"V^iE;h{)i/p-"N;-n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v_?m2`g4)yo-370"~|m_ Ao{We_IR~e<5>|Vif/cv4 O V @@LD6>c=Ca_{[`@?_8].+ PtOXf 'Ndl%QG @}ajoI>x^e~_n7:{IA0 J` [K<t'' <math>
```

```
{/T>)7Ll(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[|!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
FZO5~z, {!m:^B><Dz^{}\&+pIZom[[n^hwy]qo @i}NW]?vGrV?~vZkfg5x}nz`=
4h5ao-L\QyOx]I*}q^KcQ|=cvL?w}]hytV:&e/c|^1N}-PF!~zcOJ
<y?9zva9a-g<yX@@@:. |1rnvRK-
wv%4j{GwL>9K_6X}U/i?>sBj1UV^;a'n]sy7nc6pz7YO?,<_!Plz?D>[vi_/z@>`+Z=3a
\{CG;b]]U>Z
E&7VZfnlGkXVXasI@@@@@Z3<4HjL zoTZ78oGr=$ N,z2i!I}f?v'Bv~
A?dv}oNBd~9OnnSjg]_y]o)j)rQjuuu>a
:JM0!~%Ez?LV9Tjm
ue T:@,6@7mzG==&~r8:LO`cv{<>y0
@@@@#DRfi^[6|}WvAs{7dy|5iQ)it0 L*=^|"R:`G}O6y]u
6;:U[n|m<8y<92o\{(c+.:cmZOLmD\{I=Pi\8\% g'.'L;x5@*Z=/i<wx)\}
D2p<W>~{1z$]`Y/tLyIaoHarmWxS?g^{5l~Uw/2NIapxWLOG=a7yx^P&NXb]=.5>nLS!$xjv#S_x*\-
~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@
.RE]zC(:?;C|Ja'5
Tdu,^qufh}eAG/8iV6q<{Ly = 4i3lvlsYMSv[OSpbx0`9:G@@@:r |q{KM^Bljx;uUWY
1
```

klOIOWd!'Zn.P`\_^z{H;l6FN9j\*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5:

H;196

```
\label{eq:stars} \begin{array}{l} \text{oz}; k/=\_fm/\\ 2|; r1Tk,.8!Mnu`\___{6*}: Gq4p77m?N[>TbK$!\\ 5W{Wg4(\_r~s:a~~=j5RJPo]/ol`_?Yn64@@@@H<#l\\ 6(N;[IAm9n5GW%\<y/}{i>Penj![{5'}@]tAjS~9_lQw8{?.IS@`u[=9cg~gA5"><XMVy\\ 4&Iw_]gWqa@@@@@!.57kv }+N>;^{0}?{F^d;mo}mZa_FJ<RxF5d^0Hp26+[.oZT`Bc(-Bv{CRK_~5oZ[#?yzeIv}tw?m?z~<dv=oI\\ q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG\\ dZa>d_|11Hx{;+c((G)|IN.}{^z00]|yU^~u[h3lLe]6=tma}\\ 35OM{Dz])]zi6), [50WWWgG@;=Id@@@vwJs~vM6B=3f'H}9$`yyOx9qo-3g}I]8->nj{%^Kzn4\_sXfUW}p6eT\\ Q??aw!<cvo^qA\\ ;@A-a:`]rknkZ<D>.c?_:K.Q8=J^SO=UV4f5j}D;L;+{z\B!+~:8s{in}/oWlytVwLz}\\ & &2`x *a}A%+fut)Sk*wMSO?k8&;{Wpgz]"2}\\ ;{fwujK}\\ 0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B} \end{array}
```

```
v?5)yzO'K.}cCWEWTm>xm;'f7[o{eYO>b;#5Gy7J]5xO<Smo%kCoeg{otOfW}a*/MzuAX:B`X
>I
Bww/k_{<yd}]
8~`^
;dImJw]t9)b}
|CB@@@:@N!wg
7bSL52PRp`E(Li}N w-[1N;l|b&K?W fW\}!`jC~dkzzs}|rG}vp+:o5
<6[m?Onw]wZv] 307>e'+/e!d.mruzKK^L|U u=B=m=#\&\/#/l=2@@@
B +f TBY;)s}0qfO?y?5q;}<
}-Zj mn!<a7x8fc7fr7hn6xE[j~ vmXqW^/ z4*jgybO
   @#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8*_@V,<('zuYO>uX:=:~
z|Em
f^v!}W15-oz-c~@@@@@PK5!0mt+U$ZR@c+.^R\nO]+
6grsRg~l=9n2]w~zK.wo_|%g& @C
=xL3f~S`jS-(0gNBg
~[*;*hV?}]uUvGZy@`!w]r% @@@mJnkw-
EMBt=RYKm;ng!#hx8v&{)b]tQ;A@@@jCqj"2KA5q}&cWAjiu4n8O-(Gd@@@-
u}nOaEK.wheUW.d@@@@ZrL^
mcKuMO/:d}Ikh@@@@ 21%%1:H.]-L4fZ@@@@@zR;I <<g f_ #" R}! 0#xv
  @[
hKm < 0- m)-w@3g{gZ*J'}
'@<U%[|gmQUiW }v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s}4Fe |E>}t9ri[IT@|Y=chY @@,e1 Xr%m!vwyvg
Do/x;umege>[j_~e]P(7hkYf0`@c=>h@N8[uUme]\pAp
onr}o!zvXb ;*8;`&
  @ h1J6;w}>3SO>92R{~Bc
6 \sim 8t - n Ut
\label{eq:capacity} $$ $ c-gFzg}-{=DZo=cjvA/l.}Vwu\%?og[m]|9sBO?pvGy/byZh}GU\+Bhu~KCv~:Z''m*s=8~H;Sa $$ $ Compared to the set of th
@TSr-]ae7?dwjj^hD=M@[
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zmkxr^xoBmC-B[]~{[$ j/}.]qsOY;ZW#AF1"f7h#>|xnbMl\n'|GCrHJDji@I>T?y]Ue=OBM[.j;%/Ew94vxM|09F5!
kW}?Gy$L[q2,X+i`^E[o;t?O@C]4mnv,H%vum/Gu{B18*9$C{7]OU|\)O!?ePUrK\~T&et{#}9U@H]E6o_>VsxyJY
mdkjZx?-RW \sim .IrwU^{*}
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D5ur-*M{X`J'4fKhneJyuS,k~6-
qt@@V^Uc>.y<wNy!A^?|#q{9^pSGmJ/'_uXP&/L?^SXr1zt/n^dyx)y@:y<wm?<^xh_}m4_:Y?Oe|2i0O/O06Wj&`
Gqn+hy^ QtwC?>fonKn}
wO^W^/wMhM_Q\#i\#/+xN'mg6+*t>P^]rd7a$dVg'm;>Cqra.LK?x^@+=+<,WFm}GV>j?K/hO'Iem/+x!#=T7yr@e>
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9>F8s/lpz<=Fu}`7Z_TJux/yk[9kswWO^{IEljW/p.xkl^^{gB^u|<dk
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 $o\} > n\{9sJw \sim s \land @ @hIZ6,7 | \sMlM0^{m;m\%s3@ @*!/?Ywt \44'\#GonF9n7\&O-B}: TU=nu \sim b \sim tV[m5Kk*@ @F < Os6sAwn \sim u_| \\ \label{eq:software}$ 

 $f,W_U#$ lCW $d=eT\{mUW\}$ 

 $\label{eq:source} operator $$ o;e^VX ~Y[j!e&hw;N;zCo=ONoKh8_3;{6qb}zwdCll>_YJ&g(}]{;Y?fKyzt=zxZk-kmVc=6w_!@@`Bj6hzGK[6~]r56nv|hN7~so^M'=N:6>S>n $$ operator $$ o$ 

 $_{y*/\&L\&}tu{G|9^[/]ofIvR:gxWW''{?u5c'7n7}~7'&y28ze]Oa'oN)y:$7N9~m%(Y @ @$ 

 $\label{eq:stars} 6Xz\%O\|\%WK+wg."mE)wV/wcN1c; [ljKlSNg\{GahpY,'G`_k=wm^;vYc;nuzG>hDr2+?f^*,4`A7l`/^|U\{C_Fmwf^*Z,OwREr\}$ 

 $v;![L.\1`UiK/gk~5uckGL+6x\#]|Xsy\{Zuuq7>jtGvA3\ 30f3a\}74mnw6ulCgcfU0n.v]wI'\& @ Carrow Carrow$ 

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@ P"`Hn_M'FF!4/-~fk[z=sM6 O?1W. #c{3nrMk:W,:imQK+>}7c
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 $\label{eq:sop} $$ $$ AZ831^fdM:_Vzu$->lC@RWFn=1$mFWn]bL:+=v]|O8^4>V2; E007xh7Q[=pr]M#"o_L/]fqe|4;1q3,Q?; @ @@.Rs)S_=g1B+ ehv's8k:rhv} `XbvdkzXm,>9<1gO[neMkLnqrH!Fgz3/?g-$=Sox?g=c@\'7|!iR vXo4Oyztz,jg p ]$ 

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% @ @ C l'O.mbk?j~1[]eEZkVlgE'}aOd\^6X]F~q8blVnNkWJ+X>tV>}"wM6J+r#({|mtvXt
```

eYA^9 gEXw8V<

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!zMqLNlj&+ww5|f |ov_>Tg^i7@k,z'.~)?'o~<yvr86w@=lW;Y.2\v6x:3fG?qE]dwq]qo @ @4F
```

W]?z{7A@.c.{AnL8#uos

3f@u\*vqGa`L

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oEX_j!r$QP<Q!Y>\%]V.s|oqnTpj\}Z/Cj{j`I,|\&@1/+at?>.TR:{g~h2>FI^{4;Bf=-}}
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 $7[{lm-g7@@ 9?v/}$ 

`/=!#GwAIy^juW7rF\*CW\_XO?\_ynyr'V\a9[

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KluxvRQD=L]]T~[g'E\:>P9s1"|28< @ @vsoBs~

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 $\label{eq:2} ZtQQU?=6w+{V}vMZ[vi'{j.w!wnYw_-NXvU_=1u}{v5?8uq7w_UWO-if}-0_ckk~K$LN?_~wo[wusJ@ @ %P_;en>2/6q$, AaPqz?\/;FGG`g7LK/5/+^`H1A#[v7VV[ehzd}tL+-~Ps{3t5RX F\]f;`>c'xM< \label{eq:2}$ 

\kKjlYbo}8Bh6

KvveXbX[Y]:100z:wV^G/[~[\*]WPg=4>C k/)@ @ 8yGU:G~ReA?ZK4i{}

Hh'b/|.ju+40k>o>\_5z3l\K)h{6WV49wp@V[9J[m\*,

 $X_{7n3M}$ 

s%

 $x7mW3k\{9@ @`.'>e.> 0CVAVS=A?_x^xV_\}MU(\{DfIOL\#vip&O,\{iwygX~,!@$ 

 $\label{eq:action} $$ AeP12Cs<\label{eq:action} $$ AeP12Cs<\label{eq:action} $$ P89u\t<7IDAT?.XSlkG\<F61uC/mx'qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @ P>+J 0A`F0 $$ Particular $$ Particular$ 

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0C6z{QiAmIk3"%\2=ztLb^~e[fePh

@ @h\_!Wnm.CKJJ3-OXn~1@Z+c@ @ 3@]lA+7/<41l"-a[@ @ Rv4M|5>,AwH1j&hBFW @ @ ("@%eTw% @ @@mC6\ @ @ `hS@ @ @jC@mR+ @ @ @M N @ @ pV@ @ @@"AM@ @ @

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mUW=z!Coo=?hV'l+7|KX=mu?O.0m4lwv)Ur

RKnhzk @hYZ7G P}&O?]c

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tcB:vcDtB9chY]@h:|UA*|no=cJ)(i)v!!>)(}D~A?){VyI?R+:6d^>99A=*(PNmH> ct2pR+//HQPDt#
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iR7JA%ig7[M$e#)Db%-jw{,_vRdFSGRrRjU*w?<kx8\J6.6Kf&KiqLyzj)gV4:Vy:NZJs7Rve
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U8O:1e Mkz^K.#+<#=x>3^\*JsS/V)#$[neXAJ3iV*3 2k~VDKFz* V5W[IgR|RoYvs<;];]R,b\Vs
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fIA^l"wWE_c%zsneKKY0*W[kRu]4*V3)RifDAJOhwwr_aj-Q
_{iRKlwGf2`DQz)@[X+AVK=K#m<B0z1{?ok~&=w?4'}mSF{}W
z[nLxR3QRyK%|Rl-qVf,>-</Oc&Y")S,;\!1N|@ 0CzsM
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6Re>d}\$\*[bi

 $\label{eq:constraint} 1?7u)C\q;SW/Hr;rj/uFi/\N\%~V)\%Rhr\sw@>f'gf/Jk)TZji[dA0RO>\&t)t)2\smallebrackset)Smallebrackset)$ 

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@3\*6W]ItTiEzcz &4)=p'|thVrFii\$TkITJt(V\$-9aLzHx97Fjrz4hk7v/e/r^dYjk[orUJK \*A@Ne zd6~@6kbc:Ck]

XE/[9)tE\Ri4W=A2hFgd,(H%~KLOV#Eat-ER{b>XOzvFjoPR5>iGs6UWrnp]eReJ

 $fehK D3oKQlC -) FIIRYGCEHiMOeT ~) N)]^{@Tiu[Cs7^7WUso;M]4 G2DjdF@$ 

 $iFvtlQzk^{=}J[ySsmK3J\hwFPG+8v[n)t,?bsK)^{=}1"dMO|N]AQ$ 

 $r\%|1OOn4G8s\text{-}5lg5BA6H > c < 8\{ td24H'NSRB3tMlSA[.z)r\#KP^{W} + @b \\$ 

=dtA @Z.Z:zZ%CSE>RI4"?-

r'!ED1R)+"]\*EDJu)

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 $\label{eq:h1} H1j>k6dD5pGnnn(^{34}+zg^pIr\&k,n*osT~h$10pWbR7rMqRBhDJnqF3ed(3L{`=wry}.yaQ^{7})s'u4k!@@%0TBm.GGVY%F_}guVU UG6-O1tiyeijkpKhOgzR?H54O-WJX.*QR (R`RGAu-MCC) Contract (RC) Co$ 

 $"^krk7^{T}=:P<\R]/]T"s+,Iy"cFrK:lC>mV$ 

K,SJIV-

 $\label{eq:lessense} $$ [lE?^>:W"$Nr2/cJd]`%?%.B() #>R9IVV^y^^ cIg"qU7, (pKwK~\IrG'a) $$ (pKwK-\IrG'a) $$ ($ 

 $qCEJIIPXkP(ax1.:>^>>i=!)j7+^{qE8}wn-$ 

 $DWrniPgN rAQ|M!2[L|[]v\g4WL <\!\!e\aze;?S|x+B?]U+)_{\#<PF^{+}+Ae\$}, wYskg9Q$ 

 $n19YVsNtOV7?y]uO^{t1}=mvghBY\} < DRF\}Mu7\} > nXL \ Wu-rIzvONi(x3bs\} < 6w\{S^{L}\}:zJrqg|karrow hard here and here$ 

}l)%CRV(&}N{)I\_5}vA7=tizkh /~6[RJ^DJXf

7+J)}>Gyx/Vs. )G\_'e|{^&R~kuGZzu9ro,7`B!eTR~D^\\ yb>;:~OJ,zdHdXx7;kPqCO:@\$R2gE5Y~2f1Ik\+1 -2zgJ\_H'Ly>3!nr`yX\*P

 $\label{eq:2.1} Z@".!D> zpg t \{Wp+M(obCA2Q/?V) \#W>hc\}.\nBH5\$'R p_k2 \ \#u\&/B)on82[|6kBMU\{+r7Fa*|Q_g+AMHPZ3:K>^b!WdWREC5Dn+Cri''W4c5z\&|(6GcXVAc,<?\^ls) \#]UMzF)MOXd5aKrcB\02$tt\S;Am=9^}]3gY:<7:OZy9TkJd|Ep \(https://tnc]>$sN.W5\%uP5>LaWfJWL!-y7z5z\%R*r7~KE[@jK`Y69O>/6h`5{tod}$ 

 $\label{eq:heat} H/RT" QM XM>MFvv"eBTH) > C>d>yn), 1EoS<^:/>z6/yI'^h; N^Q)uUs.KCJHX\_n5-N2JQZ3mLfC )ib[:IRcg -y(w~KW,'N 3#v82F6NOpv(.Hc K #z/W~jA<all!]Wkq+ WcS' LH : NIi& 0L(QD2dUUw[3wt^B m$@m@6@@']D.@@h9m2@@@@`9b@@@h}js@PC \\$ 

@ @ @h\*M%Fy#8@ @ @.\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J`@

XM5@ @ @@

0Cp @ @ V`h+gv@ @ @jH@

R5 @ @ @ V @ @ j@ @ @@[!A @ @ @!5K @ @ B@[9 @ @ PCj!@ @ @mr&h @ @ @0.UC @ @ mL@ @ @@

`!\@@@@PCT

@ @ @h+03A; @ @ @5\$Ap @ @ V?&dIENDB`Screenshot 2024-08-20 at 6.00.11/ PM.pngimage/png9 A<J

EnUsI)-V{!77

 $4y\_substg1.0\_370E001F*Z\_substg1.0\_371D0102*[\_substg1.0\_3A0C001F* \_substg1.0\_80020102*U$ 

IHDRpQsRGBgAMAa pHYs%%IR\$UIDATx^xUOH5

( bG{/XQEA:H&#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a\_010 aL`0`ca0/d8')QO\w ,,!%;5.Q'{R4om ]sn\$&&%gRtiZ]v'RJ5"e S"7+e]{HHH7hRZ51xYF9a7

L(9cwhz),,,2

'Tr97N<)

 $2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\Br[18x'5"31\$3cr]$ 

 $SR\%19\$\$:q\\uEE:QEt]JJ=[sm~*zn7sQ~6L_/$ 

$$\label{eq:starter} \begin{split} & \mbox{full} M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G)_~z<o_U`>z.Ai0d%C~$2gMC9ey'oV+V \\ & \mbox{uU=OnfmB}><32o<ZQ1+W?:WwG:7\Ciy7U;:u^[YT,/hocQF,k'|R8/+=H3bDys<5_'#@.x6vcw'JxG>kNm_,/+H \\ & \mbox{>a8IH<m$Y\%Av8]}`W^&L# n-vqq,ID4R \end{split}$$

 $\label{eq:svnx1+~} SVYnX1+~)yJz; Hmw>(cueaE0^/BCJa)hBK'''''Te)re^z*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF\$.]5/_^/.S#/''|N=zB\&Du$ 

7H^]xzu3DK/Tvu\$\$I`RbE];oms\_F}D5kB{9MAL ;|cCoQ/I\*U[R\* I}D!GSw,<yS>{85.%\$cc;#u[z,uNPy iS?BoUB)yv\$+nz(U>+GI

 $HPHTQyNuRSYP9E\}{\sim}J4*K\{7mM{=}d[/Q?JrRx1iXw{>}5Hk?y0Y_!F$ 

 $\label{eq:w_started} W_{Uc1tEF`@1[nUc(k6_b$)RDC]B^dPpMcG}QsBO-4w6mTG\wWQZ\ .erZhh)/yP7q7mN)\ d!F@_]*.$ 

12 q1B=OR\*n<pCZsHH

rr5w"9NY0Y.^Ifr8&E<|VlJOTX:&?!W)fy27GejjW6OSeo\$:b!=<l:mKw&cG;RCV}\:y[N6J/?%on.t00oe2e,)WDwcd =&0Yej(Q5BGC 64^w?gysZj7F

 $F\02c;S"\#\#5$ 

 $a6@C55~xft1+5?;PIabL~~?j_4iDCcn5rkOC(&Nq\$6;GI:_CP3/'1\$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf`iqq-sJFxup*8\\0IZyOCI{H_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B*54Bn/k('\z`yA`rAp^$$ 

ru?h[O<-FVr3]Qp>lF

 $<\!\!B"zn~F.inXU|?"nlD}S<\!\!K~7:>\!iOOO||D8g^k >\!\!\#Jk*1DjH6m+-<\!\!>qvwUnyv<8]R`<\!\!8zYG^>Ai*w=w#v<\!U.JE@&V14#wFlbsB~->[m2."mW#?R %M>5R!]Z90z?((C)$ 

uM8hA?\_\_\_

 $\label{eq:starses} 1_\XfsAXnc!6~lb=(3^Y9Amq;3F-{je\%6.E;,gx|QZ\backslash1!F\$7DzyW|;wgh\backslash-TYN[0'ieRPA<>-1)} \\$ 

^\*:vm2>&`TMX0W\q16\_CE( CLXXp=\

B > Ak

 $O\O+k]zC[1g"+Bc\/b+L7[a*<5y5xG\%GXF\{L<\}j\{M"8675]3?tWg`i6"rzW~Cn~\#<9$ 

'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt\$BE4&)O

 $6q?, @^qC/>;$ 

 $BE^{exp-?9D0\&52-Qw'|P7BKy$ 

 $:o-;^uh}Mg[!.$ 

 $6T*z7UB:Go2^{+}HP \ rf \ P<l;KK\&<\% z\sim fxS/(mYp\#FR\{\$as.;/ecAj]xxF-'88(:\& absorbed a$ 

 $O{\sim}. \ oqoOnO{>} \#{<}, tFhFzO6ME)f]!, Ai@IO\}F{+}3sw!(\J;J$=o;X"e_,Wwkp|T($q )a{+}a0B10Nc!20/a{\sim}0\&0a_010)$ 

 $aL`0`ca?Og4ys25a?>\#xf*f}0 w8Pdg1`rIy% @2Y\#SoZ|t*)(w0?^033;$ 

 $>0M7g+b^{#?ff,b_7z>|coF}xYJa^{GPcF'be_`.1>LLufa7azfka~gj}1\&OSC;V0k\&f|udNUV tRL701\#1/B -^4qpQ[6 @x N7I" #vL8I 1 \&m00Y$ 

0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3

7nXgxfF`/;Nk

 $0L^{0}(b0xg<$ 

a5yk =!\*[x?

/>yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa >[|w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad% LLG,;&bkK!rK\$)o\$\_BrKHB5aFVOF#'|<\$x\$qew a>vaYla0/a~&?~<x[&;O\_:v''EnLJ<hY>^g;11In|vGK2lf}Km^I\ihcM6?djoK{O]uR>Y#BSofx >xvo|\$wRR34Z{7%Gb Gl\_]7{t YY>&

 $\label{eq:2} zHy7ePLqiS=!113Aeo~p\%:_$\% fNLdLrRb(/KR0)QK\%:*A;:L@BhNV;/$rIhpq;,Z..FGq0|j=*\%hj\%1tCLXpB3be$+ LtHsY1KBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\$KW6}+E".\%iEE JttOet=uP9r$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu*/A;J*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH_sRZSjV3L*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G_h;vJ.WIS$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/*/-qZ*$xGi{kU!=nNs.i} LO>%KX\vmoT0o3&w3v.JHp${%9N%t5X@x?9TS7L[7]BQ"48]Q>yt)E?Ux*R%:YIqz^[wyIA N$:9hC:IK%"<\=2h{Zx#$gD} )WS6&@Lx}_+Rjq rcP6pUxXDt$ 

'\$?o\rM/g^L#4py;gK7V|8qBN5

 $\label{eq:cmp-A-iKzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55j>8/c%Kh2s+Sd%}o-Gg#GW_.=n=S#}wMEEEK1&0K+v.]/xuNM~3]0k$ 

ERjU+8+Z\*UJc\_isCd

 $j(c#){9YpH"bPv[u|h5r;}$ 

 $\label{eq:mr_action} mr[A^zOzin/X{wg|sMtAfU.|}d*m6OYFw^]qRX1'DvNCs6n1@[8&n2]39O]=Chm&0)[I2ug?<6])T"""hb =z$7jHEC6h kt_~={}!J}Yuq3iBtEi2e/e9R~}} Y50.+WVC5IPGKhYAP3g0[$ 

Kg2\*m~e0m~|ma3<2l&MTSO=ke.k>/|7jiyLS`A;{O:v(7x5k#</>@^u-7j\$z--S2dxSLyjm:6\*?

 $@4Cz!)_{;zbPqc1cdK}C,042@1v0F[v*:uR1D00?FM|FlsA$ 

icuZlask

CI1 ZW\^#3x |G94i\$o.qE9a%'\_|Q@0@P\.RT

 $D; vnT_V_1b@; \\ QYBiOOXB /> xB#c r. PQ0`5gF]mFg8$ 

 $Bx6ia.nY_{qA0} \ wQQDopRbOo\#q+@$ 

`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T

```
1~$/D4yqD.XgB6_e?&wWpa>|;6d #N~lFn8$vqC5xmb@ A0&=4.DYVZhX*THJ1PDhQ(#]fIQH 0!BBi]kB@h/k0cSG_F_PW+c;kyK;1WW$OFc;rrI4y^-~u`h1uF
```

 $0/kx.l\#_5@{HG(c2^*?u!@x/0^;,<?99189r!bM)Nq_1jDic`V2c<Vy[<TzTI\$='!y\$SL\!df29fy80Bca]70}$ 

```
aL`0`ca0/a~0\&0a\_010~aL`0`ca0/a~0\&0a\_010~aL`0`ca0/a~0\&0a\_010~aL`0`ca0/a~0\&0a\_010
```

 $aL`0`ca=\{c=\&zg\{s\{0W<3EOH/)SHIISGn*9s0YxTREJ,)K,8/(QB"\#\#eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGn*9s0YxTREJ,)K,8/(QB"\#\#eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGn*9s0YxTREJ,)K,8/(QB"\#\#eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGn*9s0YxTREJ,)K,8/(QB"\#\#eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGn*9s0YxTREJ,)K,8/(QB"\#\#eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGn*9s0YxTREJ,)K,8/(QB"#\#eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGn*9s0YxTREJ,)K,8/(QB"##eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGn*9s0YxTREJ,)K,8/(QB"##eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGn*9s0YxTREJ,)K,8/(QB"##eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGn*9s0YxTREJ,)K,8/(QB"##eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#A), SHIISGN*9s0, SHIISGN*9$ 

][opcK^NyB

v\*F]vm|zM/[n

 $+SX1cG0@;CZl)5J\!\!>\!\!i)RD_f\!<\!\!M6vZz,ukDDD]w\%$ 

 $Q_r'dka; 9+00\{0\&0a\_S,>\#)) lHxh] haFOskeR''(0@\}Qdadg, Dfa?y0Gb\%11aM0''30~aL`0`ca0/a~0&0a\_010$ 

 $aL`0N\%08?\$0G\%2\_^aal:|0c`0`ca0/a~0\&0a\_010$ 

aL`0`ca0/a~0L#xUVyKgruI"EK>nV2dII."Tk975kz0;d#Hppz2k,iws+reIk2bITT

)))\*=xw

 $0 K dy 9 pzy FDz >, \_~, XU = q]; ] IS.]n_>a, 0; er-Rrei = ZsqTTI*3gn \{I [7INN'|Rm+'OmqqqcG.9R> \backslash 4i'' = ?~< RF \}$ 

\$G=>n3r:

]v

]&:#ZGNogy~

 $i \# qyi > gg v9rxLeDt[zx < uv]^bqBn]1b.;"q]G VZuFzs]waFv\% = JeO X L.?$ 

%6KLL Wq2`wK;g:G/z661 +W5\aQhtE{\_}^ytsjy;wePfrB

\_hhOW\_?\adW\`pm8wB=|L'''OOE^G>

h|GENkq?r~s-)+ FUTnIaCh`?#

eG`/FtIjpGit;2r9so&

 $bm?qs>pq{fv}sf6oku(aFvB=O|Bx1< yRYf^x0~ozWf"s70P7< zBB ;J2"zcygtoY,]TFq*zBy!"""4aF1bgw/5gv.;Q9)Sg{*^X'MNtc=58^g8_Z"??yd]v{"EN4t}$ 

Zc"#zK.61}Eo]LUIYZHC%K0'Y\$cc<

 $.g8y7xlsD3{<}xP{-})PnSa{+}g^{}gT_jU$ 

 $7sy:"{{\#}?Cdzk1^u BxMx-m:k08.<L-[j?P}C/a, -=TVM{uV6bs;~n+vdn0\%N:nAT17eL108"30?a0\&0a_010} }$ 

 $RPL < \sim C^9 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% 4x1F6I-^L?L, Zc? | X]d5S^w-LC^9 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% 4x1F6I-^L?L, Zc? | X]d5S^w-LC^9 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. AeKAZB+] \#2 \% x < wk | < nkHYtiS. | HySad. A = wk | < nkHYtiS. | HySad. A =$ 

\_;iM7\/NMIn\rt?~o>UqQrGG6KrJ.ye#6eI.ykH%V)<54&&d\$\yQu&G."i0#pG+/]sn4n@J\*)Z\*V(/2zOS9x\*x;^y)\H= &h>11ddsK\_-RXohhtpHagXd4hwf,>="qP"X;LdCA

[doM@\oIev>5WDg;#5dGu-2uL[bcj!4GRF5C~QR%

W>GvkDHDXi0B>-K'cc\$"ZDh#t"K2eR0/9xVNQ?

۸

$$\label{eq:solution} \begin{split} & 5U]Hd|R@~Z\#"; \\ & 6zEyQzF+^{$p/VTV,oBTx&5M}ZpIJNyr;y|)Q<X6iIOGD$8(@NHp`(+7\%HJC8QY-A;Ud6nO;eP^~'5s0:t4mR5Dt/+VPPAk*73BmI~ddYagK0K?aZK{nKY7|-~wXby\Y#Bps+Kf]5jwYt^{}LL<Y9|8]v./ccc>'N x0R`#Y~KLLzoO%?>~XY?^7 \end{split}$$

?f6m|@PZ30-4z^KR

Kw\_EYCz;>

 $\label{eq:comparison} $$ 7m_|w!C5WPbJ~sn\#Q5[>izn:]E](~e:Bznrf=(Mn?u~qlO>=6.\8{m{@nXmA5k&svG#c<zhI&rj>q`)g?F&M+R'a1} = \\ MC[j.c<wUK;o<PBonM:u?+BG:t([n;u(~PtiOs+1F7oM@-ZTo)S$O<1r-_~?_G7n8}j]1,-[V[!</R>|1B]$ 

3L:UGHioJaRA\_^{K:mNFd\_\_A#

 $5 jwO < KD'_7 \sim '_aVtMa, \\ QF00a, YRsW; WK = oV7n1xkAz8P^FS5k[H\s5zN.BQG; variable over the second second$ 

```
W>N6#;#G]C[oz-Zq~LgqFon#2<Q8?`ct8q1hy>-381#Gj;vnIvy#iFcq~.38MuyyK.g:t
```

```
\label{eq:constraint} U\{<\!\!/1:gdxq1z8V\}3gz\!>\!cHsgK|_{OqFG}\{n\#zKc,=\!\!7|W^{"}=\!zwm5kmr=\}/\{6m=mqo,YSOii\#^{G4}?m^{7}nlRIs!m8Q\#\sim gpy G<\!GLuupZ;qxziy[g H_<!xS i(^<\!\!>qwB_pnU
```

BBd<IoF #\9QIH6^7Ot%\$7EP0d s<G

P7<(m+Y<0#c7m%D=?u!@>Oyk'xNBB]y|LH'7C~i#dJ.O^&Cixn`A%^O8A>;`i"o>

-"EhyWxLxsxx^C{9q[P>+H:n#nd;T#A?b]k#x6j|^xA'

0"C~gtMFa`H1/yzJf

gTu"O(! o@'i#u =M~SO

 $\label{eq:cpl} $$ D?_'Oj\u!l.S6hBu62m@X|t?^hB $$ Oj\u!l.S6hBu62m@X|t?^hB $$ Oj\u!l.S6hBu62m@X|t?^hB $$ Opt\u!l.S6hBu62m@X|t?^hB $$ Opt\u!l.S6hBu62m $$ Opt\u!l.S6hBu$ 

 $L^0^ca0/a~![}amyR^-?L1ax$ 

 $; w; w9 | .bWHr: i2IyqTbrvOH \\ wx8M = U; q+2; < \} \\ aFv_q$ 

XfI}'

```
[Obw(T_]/>|#9|zM3g_a2_N~7#i72O=6.E>#<"}yT>D>&/~uTH?9uixrec:
Mi=`!=) Wk#EqoA-6nu-uOm!.%i~jB&2]@
IIzIzu]-W_}z_^$wxyryp"GM2E
Ge/T|yy0}}qZ`_%TN:/UK0L`xyq_u4i@J*);]#+U;?A\wDEp1Iciz;(RL6SAL1Yd:{DGEKj~4j}r!M,{C2D=|`9,r6
t5MEHa2syJGU^
0L^C
U
]e!s]wHV~WJKSyE4nYBBN{za}Eo<Br+r=#e lc! ^eD9}:{My0yuY%}ca )+-Y\>c@h2
t0q
u5ixvCGHUeG$)9IL!uui+D+Kkz^I'xdXG`-6'8KrF2`T,Z/0^8)2}Y)ad ></ab V&ul\\kmygzF}"
 }$4$Dj8BA*2_>?RW";v5B
Z5'IIRd 9H*%**ZVVECR%5O.AArMv/})Q<X6Lbe9h" q ERRz/q{\
)W$2w#QmM?$^:nX;yOaW8)ev<jNd@3}Gyv ? M6sM!z 7EpfNZjWR?x <+[3eFv& P0H?aZ7N6mJ}23v%C.e
<WwX|=zu|/Bps+KfinH|1bwy`B)t>mO?T:v!|,]zA_07~k1)0C~X7n<et$&&F_9xccceu#spub1e|'_!=qE9~|7_v/!`/_>}]
O;oJ#G.CGJkZ]((ml-#H2<,\~'izr!OHuqet&nLm#,PO
Gn{)4n:p>}{mq-^X=\#{nF}}
?C.R{{:~^0cKfuxta\h.mj52qD+uH#9sB
w'+V?:cw!Rfs,<,X@=
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#=caq0&0a_010 aL`0`ca0/a~04Ys}5aha6Y6ad'L`/g-0G<'a%HN>a`
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  __substg1.0_8012101F-00000001<f%0P@0@077
77P777%:
00000003<h_substg1.0_8012101F-00000004<i_substg1.0_8012101F-
00000005 < jOOFDetectionIRankerScoreUrlExtractLanguage1.0 EmbeddedUrl1.0 CreativeWork1.0 OOFDetection2.0 CreativeWork1.0 Content and the second sec
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00000008 < m\_substg1.0\_8012101F-00000009 < n\_substg1.0\_8012101F-0000000A < o\_substg1.0\_8012101F-0000000A < o\_substg1.0\_8012101F-00000000A < o\_substg1.0\_8012100A < substg1.0\_801200A < substg1.0\_801200A < substg1.0\_801200A < substg1.0\_800A < subs
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## 1.39 microsoft® windows media 5.00

## 1.39.1 Available under license :

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-.013478;<?@BCFGHJKOPQTUVXZ[^_bcdkltuvwxyz{|}~5YGFQ\;TF
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(FYDIBOHF23S_substg1.0_0037001F*,_substg1.0_003B0102*#'/_substg1.0_003D001F*_substg1.0_003F01
02*&(2PDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-
AMAKOTHA@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange
Administrative Group
(FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f14858 substg1.0 0040001F*5< substg1.0 00410102*
%-6_substg1.0_0042001F*9._substg1.0_00430102**,;93feee6a76ad1ba6-amakothaAman Kothari
(amakotha)@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)EX:/O=EXCHANGELABS/OU=EXCHANGE
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MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
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9I_substg1.0_00710102*L_substg1.0_0075001F*24M485893FEEE6A76AD1BA6-AMAKOTHALicense URLs
and Parent component details for Windows 2019
LTSC image6G~M{nHEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDL_substg1.0_0076001F*N_substg1.0_0077001F*37R_substg1.0_0078001F*S_substg1.0_
007D001F*68%4$T)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
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MMALAYAN<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.pReceived:
from CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17)
by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024
```

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

12:38:28 +0000

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version: 1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

 $X-MS-Exchange-Organization-ExpirationStartTimeReason:\ OriginalSubmit$ 

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

 $X-MS-Exchange-Organization-ExpirationInterval Reason:\ Original Submit$ 

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001; X-Forefront-Antispam-Report:

CIP:255.255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

X-MS-Exchange-CrossTenant-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-CrossTenant-AuthAs: Internal

X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:I;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

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 $\_substg1.0\_007F0102*WQ\_substg1.0\_0C190102*5=Y\_substg1.0\_0C1A001F*\.\_substg1.0\_0C1D0102*:<]rod .outlook.com>@B+//o=ExchangeLabs/ou=Exchange$ 

Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f1485893feee6a76ad1ba6amakothaAman Kothari (amakotha)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA\_substg1.0\_0C1E001F\*`\_substg1.0\_0C1F001F\*;?a\_substg1.0\_0C2D0102\*e\_substg1.0\_0C2E01 02\*>@fEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHALX LX

Salil G K

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Marimuthu Malayandi (mmalayan)InboxLicense URLs and Parent component details for Windows 2019 LTSC image)EUzgbOSIq:(Zi%:(Zi%\_substg1.0\_0E1D001F\*j\_substg1.0\_0E4C0102\*CGm\_substg1.0\_0E4D0102\*n\_substg1.0\_0E4E0102\*FHo\_substg1.0\_0E580102\*p\_substg1.0\_0E590102\*EMq\_substg1.0\_0F030102\*r\_subst g1.0\_1000001F\*JLs:(Zi%:(ZiAG~M{nHHi Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

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 $OPQ/R?SOT\_UoV\XYZ[\]nOoSSBOM:$ 

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js

+QWY 13579;=GIKSU]'?"B@Q?\*%)-ACE2[:B/Marimuthu Malayandi

(mmalayan)\_\_substg1.0\_30140102\*\_\_substg1.0\_36770102\*IYJ\_\_substg1.0\_3FFA001F\*<\_\_substg1.0\_3FFB0102\* RT@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-

MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA\_substg1.0\_4022001F\*\_substg1.0\_4023001F\*SW\_substg1.0\_4024001F\*\_substg1.0\_4025001F\* VXEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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MMALAYANAman

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*._substg1.0_4039001F*[_<_substg1.0_5D01001F*$_substg1.0_5D02001F*^`$_substg1.0_5D07001F*$_substg1.0_5D08001F*A$_substg1.0_5D0A001F*$_substg1.0_5D0B001F*bd$mmalayan@cisco.comamakotha@cisco.commmalayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt_substg1.0_5D160102*_substg1.0_5FE5001F*cg,_substg1.0_65E20102*_substg1.0_65E30102*fh_substg1.0_80080048*_substg1.0_800A001F*emX_substg1.0_800C001F*h_substg1.0_800D001F*jlY(!eyJJc1VybEJlaW5nU2Nhbm51ZCI6IIIsIIVybFd yaXRIVGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hF ZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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"@outputVersion": "1.0",

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"TextLength": 700,

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"English": 98.21429

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"name": "English (United States)",

"BestGuessLanguage": "en",

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"url": "https://hub.docker.com/r/microsoft/windows-servercore",

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"length": 53

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"beginIndex": 0,

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"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://www.microsoft.com/en-us/legal/third-party-notices",

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"@type": "TextSpan",

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"@type": "TextSpan",

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://corona.cisco.com/releases/331413/images/1186257",

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"@type": "TextSpan",

"beginIndex": 0,

"length": 55

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 112

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!"#\$%&'()\*+,-

 $23579:;<=?AEHIORTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz|\}~e;DNRT=Microsoft.Exchange.FocusedInbox.Models.Heuristics.DoNotReplyFeaturizer+DoNotReplyTypes;SCAT=SameOrganization;RFV=1032232302:-1=0^-1927059262:-1=0^1146315108:-1=0^1810071250:sender-4814ba42-62cb-4d22-9bd8-$ 

754c802ce6f5=512^1352796317:recipient-2bbb022a-9d21-48d8-912f-fea5626843eb=1713^1352796317:recipient-00826e84-cdce-4955-869b-660b92e52172=2561^;SV=1.0.530.0;SN=DM4PR11MB6405;MV=5010;CT=8/20/2024 12:38:30

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"url/prefixText": "notices and Image details for Windows 2019 LTSC image",

"url/suffixText": "https://3rdpartysource.microsoft.com https://3rdpartysource.microsoft.com https://3rdpartysource.micros

"url/urlTextSpan": {

"@type": "TextSpan",

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"@outputVersion": "1.0",

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https://hub.docker.com/r/microsoft/windows-servercore https://hub.docker.com/r/microsoft/windows-servercore",

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"beginIndex": 210,

"length": 37

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"@outputVersion": "1.0",

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https://3rdpartysource.microsoft.com https://

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https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.micr

https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices",

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"@outputVersion": "1.0",

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"url/suffixText": "TPSC scan https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom Please",

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   @ @A\d"
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   E)
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  @ @A\d"
P=@$@$@$@$@$@$@$@$@$@E"py$@$@$@$@$@$@$@$@$@$@$@$@A
  E)
$@$@$@$@$@$@$@$@$@$PP(H$@$@$@$@$@$@$@$@$@$@$@$@
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P=@$@$@$@$@$@$@$@$@$@E"py$@$@$@$@$@$@$@$@$@$@$@A
   E)
$@$@$@$@$@$@$@$@$PP(H$@$@$@$@$@$@$@$@$@$@$@$@
  (a)
          P=@$@$@$@$@$@$@$@$@E"py$@$@$@$@$@$@$@$@$@$@$@A
  E)
@A\d"
$@$@$@$@$@$@$@$@$PP(H$@$@$@$@$@$@$@$@$@$@$@$@
  @ @A\d"
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  E)
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@$vU
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QH
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;L[R"?^=Q\#>S_B?U = \{ov9c\}x!pU\&>bD]\}1Vs\{\sim \sin bar{SU[onw+Bgh5Klew}
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:4S7;rq
```

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```

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```

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i[]VU+/U\}? g/6MH
```

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```

```
P (L/^,pzOquUVYdppk%
```

```
B PH9nsAnAi$=4+0h>1D$SFhP_pOuST)
```

!9{]y|,o#l[x!:A0J&17ZG;Va<+r"5z;w+P)AQuo&GRQa`i6d%\*x:1ty\xU\$CT.M;w#fy n +'2tm3Jifx>N\_s\$yt] 7>IgyiJx< K? \*D!+2v|t6ER: [O/{d) 7\:\_5+#Kf1mSQ,VlQ!f--|%D4;RoAHpy9VYtx:EK!'dVTBnh\_"[H`u=mMqr%YUROh6d KR9HH"#@A 2n<H 'Mr~:G>`6% 2ipd"Lna,C<;hpye-[466%KUYz\_~ep Rj a" T lEr~D| ^wy|G!D8rkHZY rSHw}goqpB !s(Z`wBuj +^ziZ)YEA +r"]|"&%{i~C[~(:\SAn}zsAtQp"INVY\*pBCKfTc\*Qp//M1#?z]qXOT'gHA9|)<R@ ?NM?KJ{6HJFK"`TOBV.XU Yc5(n;9=3xS?Hw<PR v`S \$'6 vyGEVZMWF~yV~f[I1]!cO~&D.'?xOS5+@mZ I[y2 rsm iC# #f/uA]IuO# 6g2!LH^D6x^xn8RC)t>t(9cP{Wt M} `FI/]h8d `rC9yR"y]ko-[6L@hAKr`\$}v:EZ!L/o]}w1R/bb 8N:C c0 YwJ5sO;3UN|J '{=r>aV\_urSs %`8\*\ W,mHJ sJH K[CR\$5 ^7U5oIJ\*u=]VJZl1:YnXN/NJYbUc~]{\*Kqd)&y'6fOJY5ZLd[KciU.5dhmbj9%]{ujWKH\$ d?a XL\$@{mBlx!E#Lj\_lg9=+!Q,oF? O8Q[XKTX&CP}o/v.s"<:Pu~J+ O\$.B"EmGyT?6p{uB=9-[9I'L`#i|=Fa"W~Dkva;/A Dm1\*AWZ^bLS9Vm!Xw \$zq1VIeG'q!|BNIaNOww%V(H]%`z(S&Z/M@d@H!+SxzzxxuBmyPUGE@r`Tp|cv=\$0 %CZ`n7>b|@\$\_t}zxS \*]j^91ElU9BLu3g |fQW>rwhZqn,kv|C8!TU F\$@\$?i @Agv~(<f:}S1{4{\$s>|xP,wn[nq~O9 :3wE> eX503?/gQ] \\nWX2E39@?+<y6 }>\$Eo[za! `u]q\_Du{: A0 J\wubokXW/i2q]aLg!\*+|}eb9^{b^+hv["8,Y9Qk8y/-@}FSH4<^bG2~`&~b{,|.u~kns|RJ9D)-[e;F ^xyv~  $*:\rCd7j1x+K;]$ %sC[GUB1+& p/pG\$@\$e]Z-/ euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh  $A@6[yP|Bx*Yt=<Mp@='oUL.+w}*\sim d*y]g+E#*\y+Q#^vk7l \sim=G[6c'?]$ 5~uE 8CYQn,qn3g]tfb}cQP;^,\_=c e81LcL+g;;?j1<m<8 !P49Ss9JRjGh DH0Yq8p]b! m:7 M/\_j9\?L-W!\pNgOIOO},36[6.%&nqO"Q{ {#\_FFr.xLMTy=s5v{rq!Kq@ugx L)+Lz{Gsj23 >Z; $[qmXyYBe{\$@E}gY1rCOy^ m7_SPdMD\# =\%coH D@($ z ygAakyK7Lh;X:\$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe \$paUzy 78?~>XkWc0`&n'\_Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6)\_\_)VqK\$A pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:\${X#(0#THK^ gs\gF|7\*NvM\$@\$;\!;~<H r.ZUpUT;vt9Zb!19PGA3^~C>14>\*3fp.Ua :z)>jNf fu~ Gu%u(+`bZ 8%`\:"q|%T/13g"S ,An?+G?c URx<o;wn9XPNi]jwK:D4s:U:w5-7]wXH1yRhcKk{(WJ.9j&y:bd %Jh6fC~goHq'f#|n v8v + b5jlO>z/!b[Oa\$q cimc=T8PZ{U+ Y/ 0%uKG-\*#F' w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg mf ' }|wY ,v|<ap3B@ASZ?! ! ~?

```
#8VBX@[B`O?<
33u'|_yQ#86"_ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
chqyIHHH6
EIHrG*C#?>;bB_~p2fK#/j0JFrN`kc^06lu">&M6c[nP}.H,|IUV!8a0:99nu]g9u,U7$7[N+B
+r2@Bf.wSP~*QpGpp\Y\Fp3o^a+uU,>#+yv4V\1|\P\ 0\8.dYW\K2sf"H (d{/EuS^w})
P"7k+e$j(%SRG;]]#++?;6h`8eR$-4E*mT0a$ oHp"a/a7n~#1Nw8,Z(w]>F[$II|onJS4~GN
cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$p(S"
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$PP('
                                    ?(:$@$@$@$@$@$@$@$@$@$P P('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$PP('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$PP('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
    ?(:$@$@$@$@$@$@$@$@$@$PP('
   ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P(';w D:tbICn
   M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH$@$@$@$@$@$@$@UXH{[NrI9CjQq$@$@$@$@$@$@$P8 P(&c+W#Fq/l>oF-[f0
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^_mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/{z+VVO>4lN>d0`3>
@W7xCpp<\=4kQ:ukg|RuSSSs~Z K/MGRF
                 @11*=md{/Eu@ip>LId}Ye,\IA[C>$Iz\Q${NA(o;pNn)}
>6mZa ?IKKw3QFe
9j*)VX:>-(*
0bC
mqF]l?2i$;w.>SO=%wqGP9
&w)9%4AmKN?t3gN>.7xcSN(vD/~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+_`8
"%\bgbY%ew{,'{
6>8
       "P HHL|{W }t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
usx-,#
g:tampVC tx/#
fIY3fnu
4vXkE^{;}Pxqn + NW^{f1->H.92+n}kA
!L=Z h([t5>a7 `@_,X UFXmip
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiYjF8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K_|0IHHHHHH,h*
GVeRm$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r
xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK_A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
```

T[.?x# r O~" @!3JN2U%r {AeS3d [lq j%\*\$/un^[|r-x:)0#g@B,z3zjor091; y|0D0(C=\$2x%p`<`T1M; rB6g11# bXz={CrO\$@\$@\$@\$@\$@\$@;g H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(\_[n':Q5IA0\*\_fS0nV#NCY\_+WsNK]Haa9 8 p~ 1BH fxC:F8(6b\_lLizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku\_aqeJfcpA8?\$uM[NsZZPFNe!f&X 83 GcX&{`(\$@\$@\$@\$@\$@\$@\$@ #Jg1q W%\\$ @;J?f#W7aW"QF^BP9@R^sa &\*`yg\$0@[o0C-?)k\_ g hmf8mBL|E(F [0]00v V~!zCNc06 HQ)\$@\$@\$@\$@\$@\$@\$@'Ag3IF24a6N YSP1e?K(IM"o)0YFw Iux^'XaM4I0b&\*6e^2fGz6Ei=5=aLD^F0[\$ aj^!F|LX6I|a1!\*<yqtE9g,\$@\$@\$@\$@\$@\$@\$@\$@A F,A\$pu/ N(Z > b)[Kie]pB8::ZL|??6l mu'1,hB4i>xkyuky/Em{O>qk}unAofb8BM`2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq \%8w@A E5P veyk3gbC}-P>kD/oO? o<LG<G!}7n[;#>@71"  $x?(-3\&B8YF wsX9-(olkfU[ZEt'8"dh0 L F={o}])$ GKMkf<c360|;1 ,kN{=]\$6^^uNh1bf\$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC I/b#?F wU0b}5E|rCa`FA}R|fFmV?G87|WP%Bh4PZ\$p`dgB8%/Xg"O?TI}Fbf\$xA1a@"n;/G{.>^p~E~WO\$EhzJ?HCNII6= dnrHHHHHHB JLr~EV`/W\_s='&y.\$/7,[%,<r<3^5aDJ\*>=+JW\_}Utn7U0+PC-S7!T0]]?yRS%-~0G(P Wp>QXZJ }q0:!)`5>mm&Sq!00b]HfPHHHHHHH|P5.RIrf2N-z{Ix w;=3Ycd\$rY6B\*IhQZQj/@<x(0sN9pG%Q>:wFFitE~o[6<x7#:!%!{xpi}a(@H+Dl`6I]"R `+rHH\$jQ w|Axke!<O[\*@%|4lP)IA| TH4T" s?aHHHHHHHQcPJp8)BPY]"\$ { @ \$aUjDdf ORHT #0SY4m)fX? JXDI\$@\$@\$@\$@\$@\$@\$P1 A @)jL %)I9zU0TDb\$ {\`!aun\*^}J}\$<Th(\$@\$@\$@\$@\$@\$@\$@\$@KTB #gJ\*Oc@Pd!1@@v,>uJA%-0J `ZHHHHHHHHHHHL8IW( J2dgHLW3'0Ac@@:vd.)X;+SN0 @IA^ (Gh(G7]! "@@Ie\$@\$@\$@\$@\$@\$@\$@\$@\$PPnB\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@%@%E \*}V\$+}`R~quYZ: {"A>m`\$@\$@\$@\$@\$@\$@\$@\$@\$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII \*I@ `oPC}zMOV%P "M6I (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4 7@q({OCYrPRN P\t @Y`IHHHHHHHHH 3GpNb9!0Ac@v2g8a\*}!&g+\*^SAY0 PJ %>& R"@@)f3\$@\$@\$@\$@\$@\$e\$t\*@IDAT\$@\$@\$@\$Ph(KIHHHHHHHHHHHH (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eIIHHHHHHHHHHH @YA.m %>& R"@@)f3\$@\$@\$@\$@\$@\$@\$@\$@\$@\$Ph(KIHHHHHHHHHHH @YA.m (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eI,g\$@\$@\$PK]2%"4PMHHHHHH Dba (j%z"&3S{+eGOC7~=e`#%~\*[ tI:uJU N -LR/ w7Q @&@@?F!?SJ;+M}'ZS\$wL.Y7]'OI ;CF.?fhUk{+%&Kzk(A2%HF- XUke\_ri##I4S~]/Z<%"<gy,0}\Yr8yR

```
ThYoM^{*} \qquad @YA'(29t[N\{;?P)J[65-[)\}2{<}x_{Zk_{bS}}
```

 $NW*Kt'Ks0w3xI:\%++;\_`gITYnfM)zs$ 

:"}9y2{whLf,ZV O@o7x%5A! D

Vk!@\*Udn

 $PZ;vL6o,|[>\#=[r+VwY]g_]|(ZtlJc/P[-ChR?XF\backslash XPb0>\{+l$ 

pIt\_s !NVTZj?s.3= O#^qNWS~T#

 $\label{eq:additional} eq \& @ADr \$, \\ qlN:-[1c;\%:=w(=[6GD[x'pZq>qIxa7HAxWcdU\%*R@wB\$@\$@\$@\$@\$@\$@\$@\&C:I( <uCiii0P k_ (ymJN6MCaoC!Ct;k/gb6*2'B)6lR)+jdtV(\\ \\ Az(c)-fz>j=TuBNU0Eamq)?[fI^iK {b}) \\ \end{cases}$ 

 $hy \}; + dX, P?: H7z - jz B? W(s/+WukWV?F*hs@KqZUuN.^ia{OY\%9?fS_y569f\#@?v} + by B? +$ 

v(u.YllO\$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<\*tRSrMg!>>rAVr'JyYYd1IW

 $\label{eq:vu} Vu{IF3~Ucx}z^MY>@>gc7>6Z-R}L}oP!/Hc[v{]\&$ 

(^4/OF\$P \RR.]>+ygedYzo6^BxRhuRJ\$~F'EP-\*HzC2"SiiI2WQdRJJUINa1

 $\{8^g*Hv \backslash "O=6) > sT2Z1 | j \backslash XjS'db2*Gjl) soTy(Yk4e > 1) < sT2Z1 | j \rangle XjS'db2*Gjl) = 0$ 

]m#\*U\*>Z(N<~BQ.:7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS

 $Jip;x \ Jip;x \ Jip;$ 

```
96\[2QrrlSV,wHPpeA\]@B?^,_Q9K)+\]VA@pNxR^{c}q(w?Ir+_r/~"*'N\&)U\]p~Uca9Q\]<\{29\[ezcpBavYKz\]k6I+7HHHHHt8UJaB\@\Gamma\;\&:
```

u7EIFd2ydGHa89,\$@v

90 I&<W\_y2H:PbL3wy3xC^D+U

```
\label{eq:kprne} KPRne[q.c@!rMJrX)Q&rkGk(/mN6\]m''K6iEk/\}y\v5B=^6Q>2.rR P:U LQv*2\#uyX<)cv)n2`Dq5[d5aTdu4k8PM|zt OSf;<C+H7o-S\%womh\[yVJe`Xn12ro2kB''5cVa]\},YF)<,vntU+'
```

```
\label{eq:listic} $$ q@_i.SUy[?ic]7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2]) $$
```

\_PQ^v

 $9 \ll aV < 0M; mh \& Iy@A^2/YN-J{ \9^@_dVYU60\%-5:eO}!Q$ 

```
\label{eq:constraint} xw=ZOHHiBV; 6n6ydui&iGNoKq2O\?~2KL<C.(SSjeI_;f]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}7sS=HuO{U]#of.:#Os_|BvxKIr AxKPWF}]
```

>)`\$.\*PQ2:DWHzNJ0{R\_FiD.urRFvHduS5|E/

`6e.O^=:qk

<PFV@

:f8wfe]2zfP6??0b

P[

 $O3@W\N>*t(\&(*=wT<`s]C!w$ 

 $a:rZyV3 < B3 = pPe(mBySn`*\$YRB7?N|:U?Z^{c=05*r}SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k}$ 

djNE<zJ0`F

[Uiy

<\_&

a8OuXV`nz]0.,||3CD

 $\label{eq:sestimation} $$ $$ J$@$@$@$@$P\%' p=zSjc_,$F0K*;v:tPTXv+I.J $&0g( oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc]#fkXblm1PGU YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]Q GdHE}PZ#Od`uG((!69u<ho7Q8(wi`/_U(m'{Wu-Ve}V)9rb! v+`A{o!k*OPDG|>z}S Ka$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 $8p+I7o x<h d\Gamma<xl(]AjdWra oI&<Oe73ty#Oh61oR3-$ 

 $GHWx0?:E9tk6{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m&x*b0;x{Ktg#k==$8G)3i1u(e)B9Iznxi':.$FtlcV,r~y? ^v 9mt(b&/ga5tP{'i{w}O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj*rq=;:PKzOf$ 

 $m < ru9) GxB \ @ \ @ \ @ \ @ \ P^n IH @ (^Z$ 

 $\label{eq:constraint} \end{tabular} \end{tabular} (]) (f;:f2UU7r?XR1\_VCn'Td*xOxB1~\%0OGcDRd< 8\$l6-O8gx~I]NaHLC!$ 

D&07]

iQy\$X>co

 $S x 2xX f < [5yri2{Y>MdyaduB Wb8BU2y}$ 

$$\label{eq:constraint} \begin{split} & 6\}(/KhfSRb,?Nz'v)\#r!f?bF&ic8tl2uz\}A\$OX9\&wIjg(0@6nYP"c@joFVLJ.%wqr*jA\#[d5Vm{+7/&O4SI{} ~O'$5(SS,Vrs~Y3 #@@fK$@@tt6$'{z(!lk7C_"eA\;2d2!_3CX-k>/qA`s{g*sscZ} +#o&/g!L(3JMW=19y5 b4ytW0rkB`ZN<)P?$[>tnQ*-S]';R#BB/1U \end{split}$$

f

dYHN s;De-DFFHrrXg/Si\_]x.U((#fB 1hVc&?K3o6SSF

\*HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+".

 $:mP!b[zDLUgerJ\$ddV_?\_s.Q5u@eG\_s@>Z\&<-<qjo$ 

 $BIR!OdEnfNm < :5kBcfcf5O + ji?4J9 < \{ \sim Bv'u\&R ] o?wS, [[UcV*oW/Eq0\} < RFec/d$U(-1)] < SKBcfcf5O + ji?4J9 < \{ \sim Bv'u\&R ] o?wS, [[UcV*oW/Eq0] < RFec/d$U(-1)] < SKBcfcf5O + ji?4J9 < \{ \sim Bv'u\&R ] o?wS, [[UcV*oW/Eq0] < RFec/d$U(-1)] < SKBcfcf5O + ji?4J9 < \{ \sim Bv'u\&R ] o?wS, [[UcV*oW/Eq0] < RFec/d$U(-1)] < SKBcfcf5O + ji?4J9 < \{ \sim Bv'u\&R ] o?wS, [[UcV*oW/Eq0] < RFec/d$U(-1)] < SKBcfcf5O + ji?4J9 < \{ \sim Bv'u\&R ] o?wS, [[UcV*oW/Eq0] < RFec/d$U(-1)] < SKBcfcf5O + ji?4J9 < \{ \sim Bv'u\&R ] o?wS, [[UcV*oW/Eq0] < RFec/d$U(-1)] < SKBcfcf5O + ji?4J9 < \{ \sim Bv'u\&R ] o?wS, [[UcV*oW/Eq0] < RFec/d$U(-1)] < SKBcfcf5O + ji?4J9 < \{ \sim Bv'u\&R ] o?wS, [[UcV*oW/Eq0] < RFec/d$U(-1)] < SKBcfcf5O + ji?AJ9 < SKBcfcf5O + ji?A$ 

\$k0D%\$9JA;k6ly%u]\KWvy2Y`\*w<O9+;;{& (a40`VO\$Pzue)rUWo;sg5j!l\$-

 $nSC+="fJ(Q(@)hXIR39I>Nn)#c0_H<SOKr?[pCQQN^<{{GkI.\%_/f^*T}Dx~(2_ts]c2kKjvP@BUc1{?L&\#GS{g}}'S Mid8M~Zu/s}]$ 

 $P|)W,g\{ch/dJ$ 

7s`.w^I4]CT I]{yK)>\_z3e0',[AA,/UkISgt\eTnXK \_#v@y

c|)U[]]"]7ca]^Ei]f9cRop\_g1`Kho{Ms'%)#{#\$[#!O}Nq}Y8q[5o16one<6PyC>{mR 0~!V)\$@\$@\$@\$@H WQ) ( IIIysUwQKSl=K/k[ozX\RYS

C@B!o|\$o+zm?Q9C.&SQ\_>i@U.(S~Y\*I k,9BTw\$+c{2'pxGWc0V3^?Zw\'iO` #o{-Y38\* t% X@8iV\_ovO1T1?i

t%X@8iV\_oyQ1T1?j

 $\label{eq:main_strain} $$ MY*W3 m5F.epko?V<(|_MG <g^?a_('xD%gSeN_|/)j @ U%iSXVMd:_{}+mxxQmCem R%q1n@ #oW}FRJXBi5ko}Y)?4M3|Ux0@0Ka}*\qPXH.W&ZN)NQ(cVht3`A]>kD!*AqLz'(1(u1*F=-8lSo~mwx+NEs8)Bgco8~2n7W:|t4egz8ecM$@$@$@$P$ 

Ζ

 $b @ P\M62p @ 8q, [L4iz(On] >>^.rrw$ 

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 $orGO\&,O'1SI\; rRC = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ F$ 

~\_m7RZk??g=Yoo'W\{C=t}s9\_;6M9NwY

@ @IYJ3Vnu[MW[wuT{#'NX-ei^gz

 $7L'z3 > fO\&\Y9{A7^e < nml'7Z{bvjizrywicls='.:f<4~C2qiM\qm|K^2\&tv:WX'zf\&zs>g|?l/{\&zA^@j]G3jOn-M!} @ C2qiM \qm|K^2\&tv:WX'zf\&zs>g|?l/{&zA^@j]G3jOn-M!} @ C2qiM \qm|K^2\&tv:WX'zf\&zs>g|R^2 \qm|K^2\&tv:WX'zf\&zs>g|R^2 \qm|K^2 \q$ 

 $@`kIILZuAzPe;6~Ps:wgk9S>UJ\%; oZfx[}\%<<mFm7<?{O=}4~~K*=<Ole*/l;77wG<]9yo|3iFDIr[~@~Maximum content of the second second$ 

@s#|v&\T<;c=\*~t9g}F\_Um-jy

%xzl? &\$LJ:\_g}o)Cy#YV5T;OgDK|[s;"A1Z>7tU+xT @

 $@N@@`g|^:a85p?h;?=$ #G{Q;Q\QF(FmHV\Iwef^QI[\*?Cr=Web

 $sJ\&1N(o|\_\sim=awh|N\_|;\_\&55zSuda\&*N||Vdyo\sim[w"#c\%UYN|eO\simCkwK\&BIdh @ @|yJ>{Wt8 l:}$ 

 $l\&=lD\#o?['mn3_b~Y"L:W:^=~u\#h\backslash7q\backslash'yuOoG>2|1L~N)?5\&^WMda_D\&?n^`nL^j"a8/~$ 

 $T8 \ C5wgL9FO > C(/~f^nk\&G1mR.h''/j=^@dG \ @$ 

 $@NHZm|i(\%Ma3R7\#[O]p[\=Chc?iOm>0s\_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oa%s|nVYF]]}) = (10)$ 

@ ,1q+s-%JK\_Zi8lb/Yd\$G=jpJwa[.`u~K.\$M:3bo]z#Gv}+m{=+u7]0d7/ 8<)Ocd3OwJiHZr'\_z&7=I1|\_\_<o~mf+% J=>X}wn5 @ @uaE>cmo{U+-[s5{Y^.#3pF}XwK\$L]

 $mwMoZ\#e^{[N?jE/j]7xy/|W^y^*\sim V} \{E7Z'N>l$ 

]

 $V <= mu < \5 @ @ < eZiZO:zpvXEu6~6gXiRv-5+e]lmm?$ 

 $R\{/'gg <\!\!=\!\!F\!\!>\!\!3Z;\!nwk =\!\!Dqz + @ @VY`PUNsM\$[.'/lt2gNK/t7aLw4VM <\!\!le{\sim}ihzpWM =\!Y\&k + k'u[n9uRSZ = @ Magentarrow with the second second$ 

 $@*n?Xm\%)D+-m\%3-I\ fr2oi2wlqkt|$v;K0gK:g\%?,MN>3]t](Z\{ramC\%w6dr\%pG?\\$niMQ @ @f$ 

 $tw]:dsi8W \ 1_|g9V9W^R:::.\{+m8g/2xqfN3\}\ xdJbJ < 1M^N @ @V] @ @`w^7((ML \ O \sim d=P[h)M) \ A = M(M) \ A = M(M)$ 

 $oxCy; os\#, lAs < dM?C9/yy> @ @,`yim}3\&E`L5nunn+9zU.'A; d~x'=<o); @ @Ysv[$ 

gYs2lZM&kj3j<yw&zV{`

7lml&UVH}c+M6|`Y%kG?Z<rFmQKVv6xJ:O;|SCp !yH9S[1 @ @

t\*UM7;ynvR[oc)\_W),orOY3; LxdfV[cLTs=oZ^u]oo}>3N:/iGqDy~fmPdN2iB @ 0;^k5

?%w|3);v+0{ ii=f4

7.|+[I

t9T%6\_IZ?^sWM<qDi

/ @ @:0@sw{Zt4Z.h/zY60Bi::x/46.#8Xxoh5wnu.\bE3^]Fm-( @

 $mx^VnY7'Eewn6|^Q!?tfy =>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0/|/<o$ 

@ @M@@`nnVI{c=v)Wzs\*zlS\_\$Mmnsrc&=S,||OKFN+iw[``~Z7q7/|yX9I'4lpeo=[~T|y?% 'PJ@fN~6t}' }uOovaYgU<o[|4d29tvn--[GY<zGn= @ @@

 $vYE:|\sUCxFySZ2^zky;YvmHtT/3wu&Ib:o6myTZ+u9\&6)9udCh_|X9_3|\&'w'okL7)@\% \2\%IQR=rm2yt:k^)u8; wN;mr\~\%[mxp+g]^W63nt[2:U|nIvr-g[tnMys'< S>\% @$ 

@^gJN[l\46,nm:FNzRbwko]2qnFOw9:>:>]Y|yIt(&\_yrn>mn55H{hsFOg6`M6i.hF\$\*8N\$BSz= Q E: @&"E

AE"BMHH ';?{fgw~;39EyI5nY%8Ju70dPH`QXZc5Bkb4)TN+{/K'G)u?\`'tRZ;CsMkD4\_~YjtQPX{mw.6sT+J \$80=)<WPpW>8a[DKo=EM

3nG@@@@@8V?p;c

{Pc[5Kv[yiv3TRks%mT(B\*hBw(ZTR!vRkykn5y4VZN

fZhG]vY>QP`@zZ-

"4Q0`Ev

 ${i<}P,:g-FI$ e: Zr.RSjK.k\_=OU\_+r)\_(wPW?I/E{I3B6|\*miRI}

 $\{BR:hNRltn; fgT \sim 9"*+10):O\} + (\&8H \quad 6Y \{Q_{PW}9PR0TR/(A \sim t^n|HW \setminus 1ZNA)\} + (\&8H \otimes 12PR) +$ 

a\b:m[l=saZVmm

c,'iYJEIc8?

K-TrHRTn

-]&[oSO=#yCW^ c>3585R>\*MZGA>wP, |Ks/laBw0\_ME

```
.w!.>\!4h^]`pvJYg[iL\%me{PXc.T]*ih@S](ja<\!Rt;\!y9MJ*QR
```

```
Pz
```

```
`ZCT[Q=!.Muz{nruo-Lve\uJV&yIcPpX/RXo*4z@@@@VA?zFes _<*A:["PoV;@*V@fRt*W!
*K}k`SD_wuk1ITtH^-0y LwE [n)D2lVmYE5)sujM}k\{LOsZdk@@@@hk"5)yg{R 12cW
:uj]wfm@@@@jC@m'r$O7u3|dZ9O
zEx$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P*N'Y7Zf{w5XXb
{oIr/lxD@@@:I@c
hZ\pA\{B
6@@@@]B@]tn931e!vh (@@yFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9;G and a construction of the second s
u-z'O.: z@IDAT c$ !@o\p2X@@@@@m7r
   @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@iS@m7r @E*ba@@@@@iS@m7r
   @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
  @E*ba@@@@@jS@m7r
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   @E*ba@@@@@jS@m7r
@E*ba@@@@iS@m7r @E*ba@@@@@iS@m7r
   @E*ba@@@@@jS@m7r
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   @E*ba@@@@@jS@m7r
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@E*Z(Sfmz+!P/|K[x@@@@ P![1fKPnNuj={(eD@@@@\,Ll3ljx|^'(_]
3WTF@@@@eCee@Vw]pe4K@A$]?t]"! @45S&&V)6[@Q
*]g$@@@@hVF@+^V%IR +# Itknk--x A@g8mpVm
wxuB@@@@TM@L2FQB@@@R@[j/hve<v}ogY=8v@@@@9
 P'|j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p)
+XzZ6XsHqbu'loMkpMR?N}*va{g
?r?S^x4`mlm;3OrG;tm{}[o=klWc9&w]&" waj+mq|8{L,/&|]rO7:d
a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:l7'Mb7D/o=Tgm_nMc x9~;,h
U3Jn]w7N<Dqme-
f'' i\% | e0SL \{ cL_v\% B-XSO?Wsy^=Ozal-6cL \{ k!msfwa;`\} z^z=[av>=dwf/|GvAJY3\% \setminus WUW] f\# < b \in \mathbb{N} \}
kG \sim slZq9 \sim ?), 6 l{U > = *KH^{$S}}
i?~A5@YnP6l!k?t; C![[dw8^5W6zSgnZ:d:D?iQDUi^}{]Z}QgTj^v[?/"Ya2 @F
y)0k,eBJ$k(]B0@BIvwt'z6lM'w`)2xp2{=vW}xnw^=bU/"V^iE;h{)i/p-"N;-
n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v_?m2`g4)yo-370"~|m_
Ao{We IR~e<5>|Vif/cv4
0
V @@LD6>c=Ca_{[`@?_8|.+ PtOXf
'Ndl%QG
@ }ajoI>x^e~_~n7:{1A0 J`
[K<t"
{/T>)7Ll(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[|!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
FZO5~z, {!m:^B><Dz^{}\&+pIZom[[n^hwy]qo @i}NW]?vGrV?~vZkfg5x}nz`=
4h5ao-L(QyOx]I^{*}q^{C}CQ|=cvL?w]hytV:&e/c|^{1}N}-PF!~zcOJ
<y?9zva9a-g<yX@@@:._|1rnvRK-
wv%4j{GwL>9K_6X}U/i?>sBj1UV^;a'n]sy7nc6pz7YO?,<_!Plz?D>[vi_/z@>`+Z=3a
\{CG;b]]U>Z
```

```
E&7VZfnlGkXVXasI@@@@@Z3<4HjL zoTZ78oGr=$ N,z2j!I}f?v'Bv~
A?dv}oNBd~9OnnSjg]_y]o)j)rQjuuu>a
:JM0!~%Ez?LV9Tjm
ue T:@,6@7mzG==&~r8:LO`cv{<>y0
@@@@#DRfi^[6|}WvAs{7dy|5iQ)it0 L*=^|"R:`G}O6y]u
6;;U[n|m<8y<92o{(c+.:cmZOLmD{I=Pj\8%g'.'L;x5@*Z=/i<wx)
D2p < W > \{1z\}^Y/tLyIaoHarmWxS?g^{5l}-Uw/2NIapxWLOG=a7yx^P&NXb]=.5>nLS!$xjv#S x^-
~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@
.RE]zC(:?;C|Ja'5
Tdu,^qufh = AG/8iV6q < Ly = 4i3lvlsYMSv[OSpbx0^9:G@@@:r |q{KM^Blix;uUWY}
1
klOIOWd!'Zn.P`_^z{H;l6FN9j*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5:
H:196
oz;k/= fm/
?|;r1Tk,.8!Mnu`____{6*|:Gq4p77m?N[>TbK$!
5W{Wg4(_r~ s:a~~=j5RJPo]/ol`_?Yn64@@@@H<#l
6(N;[1Am9n5GW\%<y]{i>Pemj![{5'}@]tAjS~9 } 1Qw8{?.IS@`u[=9cg~gA5"><XMVy
4&Iw_]gWqa@@@@|.57kv }+N>;^)7?{F^d;mo}mZa_FJ<RxF5d^0Hp26+[.oZT`Bc(-
```

```
Bv{CRK_~5oZ[#?yzeIv}tw?m?z~<dv=oI
```

```
q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG
```

```
dZa > d_{11Hx} \{; +c((G)|IN.\}[^z0o]|yU^{~u}[h3]Le]6 = tma
```

```
35OM{Dz])]zi6),[50WWWgG@;=Id@@@vwJs~vM6B=3f'H}9$` yyOx9qo-3g}I}8->nj{%^Kzn4_sXfUW}p6eT Q??aw!<cvo^qA
```

```
;@A-a:`]rknkZ<D>.c?_:K.Q8=J^SO=UV4f5j}D;L;+{z\B!+~:8s{in|/oWlytVwLz
```

```
&2`x *a}A%+fut)Sk*wMSO?k8&;{Wpgz]"2
```

;{fwujK

0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B

>I

```
Bww/k_<yd]
```

8~`^

```
;dImJw]t9)b}
```

|CB@@@:@N!wg

```
7bSL52PRp`E(Li\}N_w-[1N;l|b\&K?W_fW \ !`jC~dkzzs\}|rG\}vp+:o5
```

```
B + f TBY;)s \} 0 q f O?y ?5q; \} <
```

```
}-Zj_mn!<a7x8fc7fr7hn6xE[j~_vmXqW^/_z4*jgybO
```

```
@#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8*_@V,<('zuYO>uX:=:~
```

z|Em

```
f^v!}Wl5-oz-c~@@@@ PK5!0mt+U$ZR@c+.^R\nO_]+
```

```
6grsRg{\sim}l{=}9n2]w{\sim}zK.wo{\_}|\% g\& @C
```

```
=xL3f~S`jS-(0gNBg
```

```
~[*;*hV?}]uUvGZy@`!w]r% @@@mJnkw-
```

```
EMBt=RYKm;ng!#hx8v&{)b]tQ;A@@@jCqj"2KA5q}&cWAjiu4n8O-(Gd@@@-
```

```
u}nOaEK.wheUW.d@@@@ZrL^
```

```
hKm \ < \ 0\mspace{-1.5} m)\mspace{-1.5} w @ 3g \{ g Z^*J' \\
```

```
'@<U%[|gmQUiW_}v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s}4Fe_|E>}t9ri[IT@|Y=chY @@,e1 Xr%m!vwyvg
Do/x;umege>[j_~e]P(7hkYf0`@c=>h@N8[uUme]\pAp
onr}o!zvXb ;*8;`&
 @ h1J6;w}>3SO>92R{~Bc
6 \sim 8t - n Ut
7c~gFzg}-{=DZo=cjvA/l.]Vwu%?og[m]|9sBO?pvGy/byZh}GU\`+Bhu~KCv :Z"m*s=8~H;Sa
@TSr-]ae7?dwjj^hD=M@[
uQT{K?O]ZO%5ZkFKZ'W*W@U
@>6zhIl sN U:w}s
-qy4@@ :lhSp'W U6R=mmbKZLw]H7B}?tv5K qA5cu?vu u?
@SN 4(7n.O
z0;C=44A]s9^+h3iZ@@M sk&YD&%jCYeY9n.(gbsP]5y*g\gq?ymqc M6-LVAL^iim}yS5Y2y
*{HclJ5PkGkAD5Joj-w>~jj\N>9Oq?X5M%+/<ukM{@amu}gCD:AIg%0lZyD@hmvqEFR9?~.0
zmkxr^xoBmC-B[}~{[$ j/}.]qsOY;ZW#AF1"f7h#>|xnbMl\n'|GCrHJDji@I>T?y]Ue=OBM[.j;%/Ew94vxM|09F5!
kW}?Gy$L[q2,X+i`^E[o;t?O@C]4mnv,H%vum/Gu{B18*9$C{7]OU|\)O!?ePUrK\~T&et{#}9U@H]E6o_>VsxyJY
mdkjZx?-RW \sim .IrwU^{*}
O[Y^(4Ht[D.(K['xK^~U;|7}oVZkJN}GmW_m|vBs{ :nn?7f;cm%wS6jtF]KU{
D5ur-*M{X`J'4fKhneJyuS,k~6-
qt@@V^Uc>.y<wNy!A^?|#q{9^pSGmJ/'_uXP&/L?^SXr1zt/n^dyx)y@:y<wm?<^xh_}m4_:Y?Oe|2i0O/O06Wj&`
Gqn+hy^ QtwC?>fonKn}
wO^W/wMhM Q^{\#} + xN'mg6 + t>P^]rd7a dVg'm;>Cqra.LK?x^@+=+<,WFm GV>j?K/hO'Iem/+x!#=T7yr@e>
vR|q
^s><pk2^Y0?^OG~<`,.
m^:o}|\/>Cy,{ :-
vE1 G~/qu,(:lkPi-<U<@|' t [{Y
sZl!,@@Z @MJo?T0J4?*&i6T(
mAo^ky,,a#G|
a*8zAS@ATA? 1it+^S+//
U}9[o1Gp6B@@%
G6|p^-
(((}?W~kg&}pj9?UWA
K)k
Ztczt@@[o
i^5sy~A1WPXHG[01.0YSO=5 :jyW4?^3viI*I'ul>:~6kHeWsN??nlT_|Q60!"x./1+a[)lk-U-
BC!}<]OTWTX&yn5/~M>VFtR5&dy
>U^{T}W^{H}+...
Z O~UNwQY/z0O9jV(*xkY;$SeXiDi,W<VP#T!@-uXC"NS@-
jA}2}~y/_Wqe?la7uT+Dt}1TAV@@J@U|keK5`@4T0G
I5CR?TQ?IyajekY>#w^&}dw9F~.pRLLJ{P
yP!NP*k%H*+2YmvvG?QBtE\~XF5)m
y: Pl}%
?f
LLt8j*EzX* +jSkG~xXF*TT9{
```

```
RqB6.)h]zmI0k*WtRpLt
8Ic5OIRX|e-XnBtJBdige
```

 $j \{Nj > tN^@TQ-3[VoguywwlAZi=]]Ae_-T3\$_3i$ 

<SK;#-"

 $\label{eq:start} $$x>SVyT`W10/"`V^T@#~ZqItT @//*ubqjA<j>sux ZCm]1?-%T@Sb7KtRK.lXNhH6=+@,$ 

 $0N4 / b\% Hyv_Tl!o < N=9_A\%..P$ 

lb)v{6X\$"ps^

 $LN-jeTN\%*W, pZ5g*e@s6+\{Q7/U5eky\}P5UV:+BN:(X.\{\#\}>\%T@IDATUT?\}S`$ 

 $n\_nrIT8KR-W\{>c95z:PQ:\ Pebk\}e;-quUl>VEreQdZ/RtTs$ 

 $3WXy{<}X{\setminus}{>}T|"@{\&vV"Rs:'*Uk:Czy#}$ 

7xRyuG<>Zpa4AR5Pbj0/Bym0I

 $/yM0^{5}=&iZK^{e}$ 

 $N\#n: 5?A5bMu\$x@|r's^<\!ws41ymq-$ 

 $@\#, \\ 5t: A^yO/9'y W''=0{/M/_5}z(G^z\%81, Mk\%uBd{tUBUM8i<^j?[\zaya5jTk^Av=nVrz*i&O@0L:~Yg'D{5}] \\ OMZ2(MLWHT O - ML O(-MLOO)WH OO ) \\ MKUOO - MLOO WH OO ) \\ MKOO - MKOO O ) \\ MKOO$ 

 $@JZ?({YpIU*uOoy4Xwf{-+\%}]1QvJY[k03:}\%?<A<2pYzyZmP$ 

Yq}\$c\$, t&\_9fgyuox|SAw`

}|R@`o^@Di]%-T|]7SA[ytOb)oui

 $\#5 Ov)b^{<} Uf\% > 1.\_Ftij@5+\{w) -b|L_oIm\$\z\&a-H-[$ 

RI(Z]lB]\*|'3uZk>J3c!hv-u.CA

CRhV[^a

 $\label{eq:uversel} UV[U`4lS~[X~Fm'7z?o[Y5uy$l,>A]0]1]cz]83QR7]'VGJ, UgZr*xlL*Z?\{*lyzc9p=\,^{9} '@@l; \{pL*oN|4Q?baK\, O8Gov`oB~k!\}u>^u^dk-Zb-xZk?x(^;t1mq-V~rSM. 'U?$C`ZJ[lim9'qMm|L{Z*0L5*UZLU^cMRv^=*W@MLn ^P} ]$ 

n+x+j&{sk

 $\label{eq:solution} -y, lk7j25j\% ~ 30k \; iU) Mc-8/c1mfNKi[[;^{`}) Lt-LS+&PTcZ,g) Jw[yUzn@@ZF@8vRN`r\%^?Mct~] Mct-2000 Mct-2000$ 

UXG7jzeRJPozxS;vj']xnTUR)[LRjW9Z[{8:@nBZu bMP+>Cjv^K.Osi1n\*Smuu'

 $\label{eq:sbm:str:linear} T^Z_sBM: 5T?//S=unOx3jsg6Z]x \ SoguU5Wxph+v-Uy,*'.W}) {/}B+ZkPV-^{A}$ 

+u#:4Ku%@JM0uZO2k1iC@h!-6:CKugbUwJUit^jGTV

 $?5WI,tJ/{\sim}Pj^g^{=}WJ|mV{>}mWd_{\rm I}N;S/$ 

 $) + @\ ZO \\ n\&EsV, -xU[ryFR6]N-q-B \\ O1 \\ Smwx8G \\ qEYbKKu/-v'8Fj6, |>t=P$ 

 $46 \{ ijn\_'nC = "b8Jm@ZSu>xq) \\ o1 = MK"JVh \ \&\ 1\%6? \} \\ iE](vTTJ4DkGl\ 5*"\ T/M".RCI?c\_1], \ C@JN1NB \ ACI?c\_1], \ ACI?c\_1]$ 

 $+ ETT1J*XzsI\_, \sim J > Td1cnM4KV \setminus R[K9P[om\_|q\{PQK)ET9\}tVYWX = g'i*XH + v_01R + t_0NR + t_0NR$ 

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 $E[K5+?SC![W#|h,=\$/g]T0r(oRb7"sn^{0}0k^{T}Mn<0<!kU]$ 

\*T!

 $65(R, j?:/F0+QAz]FsQz?eUVm@'+~~[>:S7vO}?\{b8?>*>GRR!*.\%]$ 

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 $9 > F8s/lpz <= Fu \ \ TZ_TJux/yk [9kswWO^{IEljW/p.xkl^{gB^u}| < dk}$ 

 $\label{eq:rescaled} Rr2V^>\\g%HKgrzaPrqfy\]\ \{?SzS=[od_t0]^<,]gbBJd;q]?brV]\ \{J?u\&8\{<.r9R]5|i^Vo(wtgZWx+p|*|sz??;VL@qvKzk;)~hc-u2@@VPWU\%U*~XO5^t$ 

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YGiubA^:Z@@

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TBXpk10>P#nC@5?}ULZ}Vw,\PSTn@Nm-We^Zk`{zh/7l5n\*4l^Rt\fM7[\$L+UXX9Zss>py(Hup[\$LS`)~e\mx >r+~[>+ `i\*yY \*LsHeT}HjIb=.pW9UCA6J;-Uo[y6dHjz :L f+!Ts \* '=C2B'W5Yz:k[W~S :d<A@huNvNOjG~x#ED|0PN5IA,hPxz5i\* 7T&ov]b B=s85Z13!](S-t~ bmOA XG~pQA9|`vCh!Ki\*85UEK@@kpo2"#`5G|K%.RxI(,VM/7 Y?# \*W!ZQK9'q[i [; MZgTTy\*z,{J? h?-sSjkQz%JXJ\*SIr\ONA]|& Wog]!}V5]WK= rV>JF5U9#+}7PAZ6{\$ <<}GL\_S E\*.%PKU(J+FZ-[5 +gyfA!Jt/wtTQlmRN><Fc @f1~b+y]SYRvp@-?\*Zi7 (f{MzB av46P?-\_uVzygfiqyY[OZ{[E}\*+/zj M/D w}5jW'~ /iZC^(jt.#'K4,m|.rQqjA\_|?mSya^=}Bx V4+>WyT{ sKcoI+Nnw<WPg \@;?Ad(xDcj[ Ι d`Wz59J@@@"[@>= t6J> 5,@@OYG@@@@@\UXZD@?n JB@@@@\*`JX@@@@@<id@@@@JT\* <id@@@@JT\* @O=g! <id@@@@JT\* 5!pqj"d@uh!l@@@@@v!@@]2 **(***a*) hl @ .N@@@@@@uy 8y\*LC@@@~>uG(@@.@@@@@X:h@@@@@ D@@@@@;u>9@@@@@f0@@@@@%@@cO@@@@@\,LD@@@@@c XA@@@@@ W@.@@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\,LD@@@@@c XA@@@@@W@.@@@@QX:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\,LD@@@@@c tX:5k^E>jDKK.{X#& kffigv! R]puz.E&@@@@e|aOasjz7|0d= We @`vj'jksUNDHI/ 4\_@X3%krk qiituFB@@@@ hke4 "eUt]) 2 T@'=-} !YKo! t`hpY'\$@@@@Z@l:)Sly[Q\("`{^cb4Fc7Xb4j5\*1{ o}>n{9sJw~s\ @ @hIZ6,7|\sMIM0^{m;m%s3@ @\*!/?Ywt\44'#GonF9n7&O-B}:TU=nu~b~tV[m5Kk\*@ @F<Os6sAwn~u |  $f,W_U#$  lCW d=eT mUW}o;e^VX~Y[j!e&hw;N;zCo=ONoKh8\_3;{6qb]zwdCll>\_YJ&g(}];Y?fKyzt=zxZk-kmVc=6w\_!@ @ `Bj 6hzGK[6~]r56nv|hN7~so^M'=N:6>S >n `\_{y\*/&L&)tu{G|9^[/]ofIvR:gxWW"{?u5c'7n7\$~7'&y28ze]Oa'oN)y:\$7N9~m%(Y @ @  $6Xz & O \leq U \\ WK + wg. \\ mE \\ WV / wc \\ lc; \\ [ljKlSNg GahpY, G`_k = wm^; \\ Vc; \\ nuzG > hDr2 + ?f^*, \\ 4^A7l^{//} \\ U \\ C_Fmwf^*Z, \\ How \\ F^*Z, \\ F^*Z,$ **OwREr** v;![L.\1`UiK/gk~5uckGL+6x#}|Xsy{Zuuq7>jtGvA3 30f3a}74mnw6ulCgcfU0n.v]wI'& @ @ P"`Hn\_M'FF!4/-~fk[z=sM6 O?1W. #c{3nrMk:W,:imQK+>}7c /gsoP^};bAZ831^fdM:\_Vzu\$->IC@RWFn=1\$mFWn]bL:+=v]|O8`4>V2;.E0O7xh7Q[=pr]M#"o\_L/]fqe|4;1q3,Q?;

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zcG[img+V|Ov_X>zWuJ?]tih!gg!!/U&Zs.&3U}-nv|sCAkHct4mf3;Mbg]p6JE?g|&Ky_wr2ey-@@{
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0C}6z{QiAmIk3"%\2=ztLb^~e[fePh
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!"#\$%&'()\*-./10PNG

IHDRpQsRGBgAMAa pHYs%%IR\$UIDATx^xUOH5

 $( bG{/XQEA:H&\#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a_010 aL`0`ca0/d8')QO\w ,,!\%;5.Q'{R4om ]sn$&&%gRtiZ]v'RJ5''e S'''7+e]{HHH7hRZ51xYF9a7} }$ 

L(9cwhz),,,2

'Tr97N<)

 $2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\Br[18x'5"31\$3cr]$ 

 $SR\%19\$\$:q\\uEE:QEt]JJ=[sm~*zn7sQ~6L_/$ 

$$\label{eq:constraint} \begin{split} & \mbox{6u}'\mbox{III}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{M}\mbox{$$

 $>a8IH < m^Y Av8]^W^&L\# n-vqq,ID4R$ 

 $\label{eq:svnx1+~} SVYnX1+~)yJz; Hmw>(cueaE0^/BCJa)hBK"""Te)re^z*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF\$.]5/_^/.S\#/"|N=zB\&Du$ 

7H^]xzu3DK/Tvu\$\$I`RbE];oms\_F}D5kB{9MAL ;|cCoQ/I\*U[R\* I}D!GSw,<yS>{85.%\$cc;#u[z,uNPy iS?BoUB)yv\$+nz(U>+GI

IS (DOUD) yv \$+112(U>+GI

 $HPHTQyNuRSYP9E\}{\sim}J4*K\{7mM{=}d[/Q?JrRx1iXw{>}5Hk?y0Y\_!F$ 

 $\label{eq:w_starter} W_{lectef`@1[nUc(k6_b$)RDC]B^dPpMcG}QsBO-4w6mTG\wWQZ\ .erZhh)/yP7q7mN)\ d!F@_]*.$ 

12 q1B=OR\*n<pCZsHH

rr5w"9NY0Y.^Ifr8&E<|VlJOTX:&?!W)fy27GejjW6OSeo\$:b!=<l:mKw&cG;RCV}\:y[N6J/?%on.t00oe2e,)WDwcd =&0Yej(Q5BGC 64^w?gysZj7F

 $F \ (02c; S'' \# \# 5$ 

 $a6@C55~xft1+5?;PIabL~~?j_4iDCcn5rkOC(&Nq$6;GI:_CP3/'1$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf`iqq-sJFxup*8}0IZyOCI{H_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B*54Bn/k('\z`yA`rAp^$$ 

ru?h[O<-FVr3}Qp>1F

 $<\!\!B"zn~F.inXU|?"nlD}S<\!\!K~7:>iOOO||D8g^k \rangle = \#Jk*1DjH6m+-<\!\!>qvwUnyv<8]R`<\!\!8zYG^>Ai*w=w#v<\!U.JE@&V14\#wFlbsB~->[m2."mW#?R %M>5R!]Z90z?((C)$ 

uM8hA?\_\_\_

 $\label{eq:starses} 1_`.\XfsAXnc!6~lb=(3^Y9Amq;3F-\{je\%6.E;,gx|QZ\1!F\$7DzyW|;wgh\-TYN[0'ieRPA<>-1)^*.\Carbon (Contemported Contemported Contemported$ 

^\*:vm2>&`TMX0W\q16\_CE( CLXXp=\

B > Ak

 $O(O+k]zC[1g"+Bc]/b+L7[a*<5y5xG%GXF{L<}j{M"8675}]3?tWg`i6"rzW~Cn~\#<9$ 

 $\label{eq:unit_weight} uN[1TC \ W \ L.n \ <?[\ |4/] X2X^t!35zt\$BE4\&)O$ 

6q?,\$@^qC/>|;

 $\label{eq:second} $$ -9r4ZyUm7L'5/*#}_zB^yQiQ&Y!.tV(_mx\XwSr'wbwQ3) $$$ 

BE^\exp-?9D0&52-Qw'|P7BKy

 $:o-;^uh}Mg[!.$ 

 $6T*z7UB:Go2^{+}HP \ rf \ P<l;KK\&<\% z~ fxS/(mYp\#FR\{sa:;/ecAj]xxF-'88(:\& CAj]xxF-'88(:\& CAj)xF-'80(:\& CA')xF-'80(:\& CA')xF-'80(:\& CA')xF-'80(:\& CA')xF-'80(:\& CA')xF-'80(:\& CA')xF-'80(:\& CA')xF-'80(:\& CA')xF-'80(:$ 

 $O{\sim}. \ oqoOnO{>} \#{<}, tFhFzO6ME)f|!, Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$q\)a{+}a0B10Nc!20/a{\sim}0\&0a\_010P|r|Ai@IO\}F{+}3sw!(\J;J\${=}o;X"e\_,Wwkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(\$a\_,Whkp|T(a\_,Whkp|T(\$a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,Whkp|T(a\_,W$ 

 $aL`0`ca?Og4ys25a? > \#xf*f \\ 0 w8Pdg1`rIy\% @2Y\#SoZ|t*)(w0?^033;$ 

 $> 0M7g+b^{#?ff,b_7z>|coF}xYJa^{GPcF'be_`.1>LLufa7azfka~gj}1\&OSC;V0k\&f|udNUV tRL701# 1/B -^4qpQ[6 @x N7I" #vL8I 1 \&m00Y$ 

0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3

7nXgxfF`/;Nk

0L`/@(b0xg<

a5yk =!\*[x?

/>yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa

>[|w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad%

LLG,;&bkK!rK\$)o\$\_BrKHB5aFVOF#'|<\$x\$qew -

 $a>vaYla0/a \sim \&? \sim < x[\&;O_:v"EnLJ < hY>^g; 11In|vGK2lf\}Km^I \ ihcM6?djoK\{O]uR>Y\#BSofx$ 

>xvo|\$wRR34Z{7%GbGl\_]7{t

YY>&

 $zHy7ePLqiS=!113Aeo~p\%: _$\% fNLdLrRb(/KR0)QK\%: *A;:L@BhNV;/$rIhpq;,Z..FGq0|j=*\%hj\%1tCLXpB3be$+ LtHsYIKBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\$KW6}+E".\%iEE JttOet=uP9r$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu*/A;J*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On_h!aPGbS[rHpd<wK>/2<-l(P9sc\r8:YH_sRZSjV3L*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G_h;vJ.WIS$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/*/-qZ*$xGi{kU!=nNs.i} LO>%KX\vmoT0o3&w3v.JHp${%9N%t5X@x?9TS7L[7]BQ"48]Q>yt)E?Ux*R%:YIqz^[wyIA N$:9hC:IK%"<\=2h{Zx#$gD}$ 

 $) WS6\&@Lx \}\_+Rjq \ rcP6pUxXDt$ 

'\$?o\rM/g^L#4py;gK7V|8qBN5

 $\label{eq:cmp-A-iKzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55j>8/c%Kh2s+Sd%} o-Gg#GW_.=n=S#}wMEEEK1&0K+v.]/xuNM~3]0k$ 

 $ERjU{+}8{+}Z{*}UJc\_isCd$ 

 $j(c\#){9YpH"bPv[u|h5r;}$ 

 $mr|A^zOzin/X{wg|sMtAfU.|}d*m6OYFw^]qRX1'DvNCs6n1@[8&n2]39O]=Chm&0)[I2ug?<6])T"""hb =z$7jHEC6h kt ~={}!J}Yuq3iBtEi2e/e9R~}Y5o.+WVC5IPGKhYAP3g0[$ 

Kg2\*m~e0m~|ma3<2l&MTSO=ke.k>/|7jiyLS`A;{O:v(7x5k#</>@^u-7j\$z--S2dxSLyjm:6\*?

 $3^M7e^Z-1?; W%y8_8^2qD=DvZJF4nf=c!@>/8/%Jhjr}7\4H<?q]w \\ v?, [.[bEiVfmjq"-aC!KK\NOA-1]) \\ v?, [.[beiVfmq"-aC!KK\NOA-1]) \\ v?, [.[beiVfmm"-aC!KK\$ 

 $@4Cz!)_{;zbPqc1cdK}C,042@1v0F[v*:uR1D00?FM|FlsA]$ 

icuZlask

CI1 ZW\^#3x |G94i\$o.qE9a%'\_|Q@0@P\.RT

D;vnT\_V\_V-1b@;}QYBiOOXB/>xB#c\r.?PQ0`5gF]mFg8

 $Bx6ia.nY_{qA0 wQQDopRbOo#q+@}$ 

`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T

 $1 \sim D4yqD.XgB6_e? \&wWpa> ; 6d \#N \sim IFn8 vqC5xmb@A0 \& = 4.DYVZhX*THJ1PDhQ(\#]fIQH has a straight and the set of the set o$ 

 $0!BBi]kB@h/k0cSG_F_PW+c;kyK;1WW\$OFc;rrI4y^--~u`h1uF$ 

 $0/kx.l\#_5@{HG(c2^*?u!@x/0^;<?99189r!bM)Nq_1jDic`V2c<Vy[<TzTI$='!y$SL\!df29fy80Bca]70}$ 

aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010

 $G\{QF[omG>(7|0@rwo)\S:w, \}v\{nwIJ\$!!A?.W_{}<X-*5j/ao/Cd^*, AAAC\$))Ie^*8f'G< y1B|>s!1c; WEkaB(S)|AAAC\$)$ 

][opcK^NyB

 $v^*F]vm|zM/[n$ 

+SX1cG0@;CZl)5J>i)RD\_f<M6vZz,ukDDD]w%

 $Q_r'dka; 9+00\{0\&0a_S,>\#)) lHxh] haFOskeR''(0@) Qdadg, Dfa?y0Gb\%11aM0''30 aL`0`ca0/a~0&0a_010'' and accords and a$ 

aL`0N%08?\$0G%2\_^aal:|0c`0`ca0/a~0&0a\_010

aL`0`ca0/a~0L#xUVyKgruI"EK>nV2dII."Tk975kz0;d#Hppz2k,iws+reIk2bITT

)))\*=xw

```
0 K dy 9 pzy FDz >, \_~, XU=q]; ]IS.]n\_>a, 0; er-Rrei=ZsqTTI*3gn{I[7INN'|Rm+'OmqqqcG.9R>\4i''=?~< RF $G=>n3r:}
```

 $]3gSBBB_k~[~IZlnZz{s=ZF{aFvOq2qDcI}e1jN:uM6zj7]dIOaDgxb]mn`1KUl\aZjic=o\-Z>}k;,Y''k>=!5j(TRZW0\# [38r4K{{^zy<.e+(P.'|P3x)}})$ 

]v

]&:#ZGNogy~

 $i \#qyi>gg \\v9rxLeDt[zx<uv]^bqBn]1b.;"q]G \\VZuFzs]waFv\%=JeO \\X L.?$ 

%6KLL Wq2`wK;g:G/z66l +W5\aQhtE{\_}^ytsjy;wePfrB

\_hhOW\_?\adW\`pm8wB=|L"'OOE^G>

 $h|GENkq?r\-s-)+FUTnIaCh\?\#$ 

eG`/FtIjpGit;2r9so&

 $bm?qs>pq\{fv]sf6oku(aFvB=O|Bx1< yRYf^x0~ozWf"s70P7< zBB ;J2"zcygtoY,]TFq*zBy!"""4aF1bgw/5gv.;Q9)Sg\{ *^X'MNtc=58^g8_Z"??yd]v{"EN4t}$ 

Zc"#zK.6l}Eo]LUIYZHC%K0'Y\$cc<

 $.g8y7xlsD3{<}xP{-})PnSa{+}g^{g}T_jU$ 

 $7sy:"{ #`?Cdzk1^u BxMx-m:k08.<L-[j?P}C/a, -=TVM{uV6bs;~n+vdn0\%N:nAT17eLl08"30?a0&0a_010 aL`0`ca0/a~0&0a_010 aL`0OLLdR"G ad@d!2a;%s;@w+wy}3eliJ4|Wm$gd'uS'Pv2P4|H/H||waFz0x?")IoK``Yp4lX_9t|j4mP f2nqL|349ai#6rDEE}*.44Dv9q<cG=/(N?-{$,4@J-RPL<~C^9"%x<wk|<nkHhYtiS.|HySad.AeKAZB+]#2"4x1F6I-^L?L,Zc?|X]d5S^w-$ 

```
_;iM7\/NMIn\rt?~o>UqQrGG6KrJ.ye#6eI.ykH%V)<54&&d$\yQu&G."i0#pG+/]sn4n@J*)Z*V(/2zOS9x*x;^y)\H= &h>11ddsK_-RXohhtpHagXd4hwf,>="qP"X;LdCA cE4&yUdJ*a&0GQ5a*@;88Xn~v_pJ2e~+V={eZ2JbRo ^_j>/. Bxq(:Yn*|g{,=^8Ni;Q2nGmKUS&gm]`g_~5- [doM@\oIev>5WDg;#5dGu-2uL[bcj!4GRF5C~QR% W>GvkDHDXi0B>-K'cc$"ZDh#t"K2eR0/9xVNQ? ^
```

$$\label{eq:solution} \begin{split} &5U]Hd|R@~Z\#"; \\ &6zEyQzF+^{$p/VTV,oBTx&5M}ZpIJNyr;y|)Q<X6iIOGD$8(@NHp`(+7\%HJC8QY-A;Ud6nO;eP^~'5s0:t4mR5Dt/+VPPAk*73BmI~ddYagK0K?aZK{nKY7|-~wXby\Y#Bps+Kf|5jwYt^{}LL<Y9|8]v./ccc>'N x0R`#Y~KLLzoO%?>~XY?^7 \end{split}$$

?f6m|@PZ30-4z^KR

Kw\_EYCz;>

 $\label{eq:comparison} 7m \ |\ w!C5WPbJ~sn\#Q5[>izn:\]E](~e:Bznrf=(Mn?u~qlO>=6.\] \\ \ (m\{@nXmA5k\&svG\#c<zhI\&rj>q`)g?F\&M+R'a1 \ (max) \$ 

 $= \{MC[j.c < wUK; o < PBonM:u? + BG:t([n;u(~PtiOs+1F7oM@-ZTo)S$O < 1r-_~?_G7n8\}j\}1, -[V[! < /R > | 1B])\}$ 

 $3L: UGHioJaRA\_^{K:mNFd\_A\#}$ 

5jwO<KD'\_7~'\_aVtMa,}QF00a,YRsW;WK=oV7n1xkAz8P^F S5k[H\s5zN.BQG;v

W>N6#; #G]C[oz-Zq~LgqFon#2<Q8?`ct8q1hy>-381#Gj; vnIvy#iFcq~.38MuyyK.g:t]

```
\label{eq:constraint} U\{<\!\!/1:gdxq1z8V\}3gz\!>\!cHsgK|_{OqFG}\{n\#zKc,=\!\!7|W^{"}=\!zwm5kmr=\}/\{6m=mqo,YSOii\#`G4?m'7nlRIs!m8Q\#~gpyG<\!GLuupZ;qxziy[gH<\!!xSi(^{>}qwBpnU]
```

BBd<IoF #\9QIH6^7Ot%\$7EP0d s<G

P7<(m+Y<0#c7m%D=?u!@>Oyk'xNBB]y|LH'7C~i#dJ.O^&Cixn`A%^O8A>;`i"o>

-"EhyWxLxsxx^C{9q[P>+H:n#nd;T#A?b]k#x6j|^xA'

0"C~gtMFa`H1/yzJf

gTu"O(! o@'i#u =M~SO

 $Cpl^#3.b^T6''D?_'Oj\u!l.S6hBu62m@X|t?`hB$ 

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00000008<m __substg1.0_8012101F-00000009<n __substg1.0_8012101F-0000000A<o __substg1.0_8012101F-0000000A
0000000B<pUrl1.0
```

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A. HISTORY OF THE SOFTWARE

\_\_\_\_\_

Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see http://www.cwi.nl) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see http://www.cnri.reston.va.us) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations, which became Zope Corporation. In 2001, the Python Software Foundation (PSF, see https://www.python.org/psf/) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation was a sponsoring member of the PSF.

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| Release                      | Deriv   | ed Yea   | ar Own   | er GPL-         |  |
|------------------------------|---------|----------|----------|-----------------|--|
| from                         |         |          | com      | compatible? (1) |  |
|                              |         |          |          |                 |  |
| 0.9.0 thru                   | 1.2     | 1991-    | 1995 CW  | [ yes           |  |
| 1.3 thru 1.                  | 5.2 1.2 | 1995     | -1999 CN | RI yes          |  |
| 1.6                          | 1.5.2   | 2000     | CNRI     | no              |  |
| 2.0                          | 1.6     | 2000     | BeOpen.c | com no          |  |
| 1.6.1                        | 1.6     | 2001     | CNRI     | yes (2)         |  |
| 2.1                          | 2.0+1.6 | .1 2001  | PSF      | no              |  |
| 2.0.1                        | 2.0+1.6 | 5.1 2001 | PSF      | yes             |  |
| 2.1.1                        | 2.1+2.0 | 0.1 2001 | PSF      | yes             |  |
| 2.1.2                        | 2.1.1   | 2002     | PSF      | yes             |  |
| 2.1.3                        | 2.1.2   | 2002     | PSF      | yes             |  |
| 2.2 and above 2.1.1 2001-now |         |          |          |                 |  |
| PSF                          | yes     |          |          |                 |  |

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# 1.42 adaptec raid controller 7.5.0.32048

# 1.42.1 Available under license :

No license file was found, but licenses were detected in source scan.

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Found in path(s):

\*/opt/cola/permits/2130786666\_1723628390.853595/0/aacraid-ws08-ws12-ws16-w7-w8-w10-sbs-x64-b52013-cert-zip/windows\_8\_10\_ws12\_ws16/X64/adpenc.inf

 $* / opt/cola/permits/2130786666\_1723628390.853595/0/aacraid-ws08-ws12-ws16-w7-w8-w10-sbs-x64-b52013-cert-zip/windows\_sbs/X64/arcsas\_sbs.inf$ 

\* /opt/cola/permits/2130786666\_1723628390.853595/0/aacraid-ws08-ws12-ws16-w7-w8-w10-sbs-x64-b52013-cert-zip/windows\_sbs/X64/adpenc.inf

\* /opt/cola/permits/2130786666\_1723628390.853595/0/aacraid-ws08-ws12-ws16-w7-w8-w10-sbs-x64-b52013-cert-zip/windows\_7\_ws08/X64/arcsas.inf

\*/opt/cola/permits/2130786666\_1723628390.853595/0/aacraid-ws08-ws12-ws16-w7-w8-w10-sbs-x64-b52013-cert-zip/windows\_8\_10\_ws12\_ws16/X64/arcsas.inf

\* /opt/cola/permits/2130786666\_1723628390.853595/0/aacraid-ws08-ws12-ws16-w7-w8-w10-sbs-x64-b52013-cert-zip/windows\_7\_ws08/X64/adpenc.inf

# 1.43 microsoft ole 2.1 for windows nt<sup>™</sup>

# operating system 2.1

# 1.43.1 Available under license :

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-.013478;<?@BCFGHJKOPQTUVXZ[^_bcdkltuvwxyz{|}~5YGFQ\;T F
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authas:InferenceClassificationResultClientInfo2CurrentMessageSafetyFlagsEntityNames,HeaderBodyFragmentList HasQuotedText&IsQuotedTextChangedacceptlanguage6ConversationIndexTrackingExdx-ms-exchangeorganization-originalclientipaddressdx-ms-exchange-organization-originalserveripaddressJx-ms-exchangeorganization-authsource,LatestMessageWordCountIsSignedIsReadReceiptPx-ms-exchange-organizationauthmechanismBInferenceClassificationTrackingExTeeVersionTeeNextScenarioTeeNextPayload.EntityExtraction/ Url1.0JX-Microsoft-Antispam-Mailbox-DeliveryBX-Microsoft-Antispam-Message-Info4InferenceMessageIdentifierNEntityExtraction/KeyPhraseExtraction2.0,x-ms-publictraffictypex-ms-has-

attach, authentication-resultsNx-ms-office365-filtering-correlation-id4x-ms-traffictypediagnostic6x-forefrontantispam-report(x-microsoft-antispamXx-ms-exchange-crosstenant-network-message-idZx-ms-exchangecrosstenant-originalarrivaltimeTx-ms-exchange-crosstenant-fromentityheader8x-ms-exchange-crosstenant-idJx-msexchange-crosstenant-mailboxtypeVx-ms-exchange-crosstenant-userprincipalnamebx-ms-exchange-transportcrosstenantheadersstampedNx-ms-exchange-transport-endtoendlatencyNx-ms-exchange-processed-bybccfoldering@x-ms-exchange-crosstenant-authasHx-ms-exchange-crosstenant-

auth source>Original Inference Classification HGriffin Inference Classification Result: Inference Classification Reason 2Cl assification Diagnostics 2Conversation Contributions, Conversation WasFocused 4 Triage Heuristics Feature Set BGriffin Triage Heuristics Feature Set: Shared With Me/HasShared Content, Focused Inbox Model Score. Shared With Me/HasWebL inkDarwin/Url 2.0@Entity Extraction/Creative Work 1.0xEntity Extraction/KeyPhrase Extraction PosTagger TeeInference Classification Reason 2Cl as the state of the sta

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ed.LastIndexingAttemptTime.ExtractedFromTEENetCore_substg1.0_10030102*(__substg1.0_10040102*__subst2.0_10040104010*__subst2.0_100400*_subst2.0_100400*_subst2.0_100400*_subst2.0_1004
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3IPM.NoteLicense URLs and Parent component details for Windows 2019 LTSC
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02*&(2PDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-
AMAKOTHA@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange
Administrative Group
(FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f14858_substg1.0_0040001F*5<_substg1.0_00410102*
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(amakotha)@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
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MMALAYANMarimuthu Malayandi (mmalayan)EX:/O=EXCHANGELABS/OU=EXCHANGE
ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
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by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

12:38:28 +0000

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version: 1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

X-MS-Exchange-CrossTenant-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-CrossTenant-AuthAs: Internal

X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

## X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:I;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

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 $\_substg1.0\_007F0102*WQ\_substg1.0\_0C190102*5=Y\_substg1.0\_0C1A001F*\.\_substg1.0\_0C1D0102*:<]rod .outlook.com>@B+//o=ExchangeLabs/ou=Exchange$ 

Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f1485893feee6a76ad1ba6amakothaAman Kothari (amakotha)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA\_substg1.0\_0C1E001F\*`\_substg1.0\_0C1F001F\*;?a\_substg1.0\_0C2D0102\*e\_substg1.0\_0C2E01 02\*>@fEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHALX LX

Salil G K

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Marimuthu Malayandi (mmalayan)InboxLicense URLs and Parent component details for Windows 2019 LTSC image)EUzgbOSIq:(Zi%:(Zi%\_substg1.0\_0E1D001F\*j\_substg1.0\_0E4C0102\*CGm\_substg1.0\_0E4D0102\*n\_ substg1.0\_0E4E0102\*FHo\_substg1.0\_0E580102\*p\_substg1.0\_0E590102\*EMq\_substg1.0\_0F030102\*r\_subst g1.0\_1000001F\*JLs:(Zi%:(ZiAG~M{nHHi

Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

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bLZFu*
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e!"w /!?# d"m#@tp://U#.$'.!/!/04/ ( m"&Gw*`.w3.g/TR/REC-40">cAead+k
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US>a:GnkFs<FRHypTHO!y5c-p8@; 99A:#467886AP-08a:uP Ue>TcED17UV5pU:U!P0@1!p=KLMX%P
owP>FRChpEau\]P_@ - ;J/K?QR>
R2s`c8RS?h/2K 79nSNjIndp_K>Glo@l:r>751&55"/-/5<dyGj#@SIN"T#@KX"v{U967D"w3#@%r-
w0&;xk}%+|@G1@`#@r+{![6},pfFg4~85A<zxS@OTH&i;mu;u,5,o^pu@w?5&<
(
8w^/A U aG.u8avWebPFPjQDE12#P;{C 1 L"FThi2P
w@0008P" P II1 c3 !LTSC pj \forall zr \[/_08,0 hPf&D&b.cPck'r/$'*Pa""etldrfw0{@HYPERL{K}} \\
```

```
`ecAdP?wra+&nbT`X'a@/?3
```

```
w@!Pp" 'Mo'M??/?Oog*b'\5 -P/w`Opl/;!Vr-O_nO_o@?/?O_oI@'81RPIw0ry T_oT?
```

?//?O\_!

```
OPQ/R?SOT_UoV\XYZ[\]nOoSSBOM:
```

```
b@xy~/?O?/?OVPqeH@kwg`4py
```

Fr?GAaF F

```
\label{eq:constraint} $$ quFH_ohpks, Awn_obOc_doeghWij0/vSg5p/dy''74 < SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com > bLTqG009 $$ an analytic straint of the second straint of the secon
```

```
js
```

+QWY 13579;=GIKSU]'?"B@Q?\*%)-ACE2[:B/Marimuthu Malayandi (mmalayan)\_substg1.0\_30140102\*\_substg1.0\_36770102\*IYJ\_substg1.0\_3FFA001F\*<\_substg1.0\_3FFB0102\* RT@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHA\_substg1.0\_4022001F\*\_substg1.0\_4023001F\*SW\_substg1.0\_4024001F\*\_substg1.0\_4025001F\* VXEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

# (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANAman

Kothari (amakotha)Aman Kothari

(amakotha)8357352A9AC74291872DEE4575F68898\_substg1.0\_4030001F\*.\_substg1.0\_4031001F\*U].\_substg 1.0\_4034001F\*R\_substg1.0\_4035001F\*Z\R-MMALAYAN8357352A9AC74291872DEE4575F68898-

## MMALAYANAman

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*._substg1.0_4039001F*[_<_substg1.0_5D01001F*$_substg1.0_5D02001F*^`$_substg1.0_5D07001F*$_substg1.0_5D08001F*A$_substg1.0_5D0A001F*$_substg1.0_5D0B001F*bd$mmalayan@cisco.comamakotha@cisco.commmalayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt_substg1.0_5D160102*_substg1.0_5FE5001F*cg,_substg1.0_65E20102*_substg1.0_65E30102*fh_substg1.0_80080048*_substg1.0_800A001F*emX_substg1.0_800C001F*h_substg1.0_800D001F*jlY(!eyJJc1VybEJlaW5nU2Nhbm51ZCI6IIIsIIVybFd yaXRIVGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hF ZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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"@context": "http://schema.microsoft.com",

"@outputVersion": "1.0",

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"TextLength": 700,

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"English": 98.21429

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"Language": {

"Locale": "en-US",

"name": "English (United States)",

"BestGuessLanguage": "en",

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

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"@entityExtractionTrustLevel": "Unknown",

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"url": "https://www.microsoft.com/en-us/legal/third-party-notices",

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"@entityExtractionTrustLevel": "Unknown",

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"@schemaOrgVersion": "1.93",

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"url/urlTextSpan": {

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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"beginIndex": 0,

"length": 55

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"@EntityId": "af484eef-5280-4c9c-8ee4-26da2dc6f0ba",

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}

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7b6ee6af4813;IDXHEAD=01DAF2FD36;IDXCOUNT=1];TFR=ThreadForkingIsDisabled;Version=Version 15.20 (Build 7875.0), Stage=H4;UP=1\_substg1.0\_8016001F\*

 $\_substg1.0\_8017001F*iyb\_substg1.0\_8018001F*J\_substg1.0\_8019001F*rt&0; DP=1; QT=9; CPBT=2001:420:5$ 448:1301:c5f:d8ba:9966:de692603:10b6:806:fa::8SA2PR11MB4793.namprd11.prod.outlook.com04BCAT=NotSur eDueToNoApplicableRul\\_substg1.0\\_801A001F\*N\\_substg1.0\\_801E001F\*sw\\_substg1.0\\_801F001F\*\\_substg1.0\\_8012001F\*sw\\_substg1.0\\_801F001F\*\\_substg1.0\\_8020001F\*vx

!"#\$%&'()\*+,-

 $23579:;<=?AEHIORTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz] \\ e;DNRT=Microsoft.Exchange.FocusedInbox.Models.Heuristics.DoNotReplyFeaturizer+DoNotReplyTypes;SCAT=SameOrganization;RFV=1032232302:-1=0^-1927059262:-1=0^1146315108:-1=0^1810071250:sender-4814ba42-62cb-4d22-9bd8-$ 

754c802ce6f5=512^1352796317:recipient-2bbb022a-9d21-48d8-912f-fea5626843eb=1713^1352796317:recipient-00826e84-cdce-4955-869b-660b92e52172=2561^;SV=1.0.530.0;SN=DM4PR11MB6405;MV=5010;CT=8/20/2024 12:38:30

PM;ODF=Inbox;IFIC=<null>;HDTR=0;HDTF=V15420240627.08\_substg1.0\_8021001F\*\_substg1.0\_8022001F\* u}\_substg1.0\_8023001F\*t@\_substg1.0\_8024001F\*z|[

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"url/suffixText": "https://3rdpartysource.microsoft.com https://3rdpartysource.microsoft.com https://3rdpartysource.micros

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"url/prefixText": "https://hub.docker.com/r/microsoft/windows-servercore

https://hub.docker.com/r/microsoft/windows-servercore https://hub.docker.com/r/microsoft/windows-servercore",

"url/suffixText": "https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notic

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"@schemaOrgVersion": "1.93",

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"url/prefixText": "https://3rdpartysource.microsoft.com

https://3rdpartysource.microsoft.com https://

"url/suffixText": "https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal

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"@schemaOrgVersion": "1.93",
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"url": "https://corona.cisco.com/releases/331413/images/1186257",

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"url/prefixText": "component This is in reference to SBOM",

"url/suffixText": "TPSC scan https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom Please",

"url/urlTextSpan": {

"@type": "TextSpan",

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"length": 55

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"url/suffixText": "Please let know if any other",

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"@type": "TextSpan",

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otDS& &@A /G\$f#-[~AHUVb@8

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`u]q_Du{: A0 J\wubokXW/i2q]aLg!*+|}eb9^{b^+hv["8,Y9Qk8y/-@}FSH4<^bG2~`&~b{,|.u~kns|RJ9D)-[e;F
^xyv~_*;\rCd7j1x+K;]%sC[GUB1 +& p /pG$@$e]Z-/
euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh
A@6'[yP|Bx*Yt=<Mp@='oUL.+w}*~d*y]g+E#*\y+Q#^vk7l_~=G[6c'?]
5~uE 8CYQn,qn3g]tfb}cQP;^,_=c e81LcL+g;;?j1<m<8
!P49Ss9JRjGh DH0Yq8p]b! m:7 M/ j9\?L-W!\pNgOIOO},36[6.%&nqO"Q{ {# FFr.xLMTy=s5v{rq!Kq@ugx
L)+Lz{Gsj23 >Z;[qmXyYBe{\$@E}gY1rCOy^ m7_SPdMD\# =\%coH D@(
z ygAakyK7Lh;X:$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe
$paUzy 78?~>XkWc0`&n' Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6} )VqK$A
pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:${X#(0#THK^ gs\gF|7*NvM$@$;\!;~<H
r.ZUpUT;vt9Zb!19PGA3^~C>14>*3fp.Ua:z)>jNf
fu~
Gu%u(+`bZ 8%`\:"q|%T/13g"S
,An?+G?c
URx<o;wn9XPNi]jwK:D4s:U:w5-7]wXH1yRhcKk{(WJ.9j&y:bd %Jh6fC~goHq'f#|n
v8v + b5jlO>z /
!b[Oa$q
cimc=T8PZ{U+
Υ/
0%uKG-*#F' w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg
mf'}|wY,v|<ap3B@ASZ?!
! ~?
#8VBX@[B`O?<
33u'| yQ#86" ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
chqyIHHH6
EIHrG*C#?>;bB_~p2fK#/j0JFrN`kc^06lu">&M6c[nP}.H,|IUV!8a0:99nu]g9u,U7$7[N+B
+r2@Bf.wSP \sim QpGpp Y$Fp30^a+uU, >#+yv4V1|\P}0`8.dYW$K2sf"H (d{/EuS^w})
P"7k+e$j(%SRG;]]#++?;6h`8eR$-4E*mT0a$ oHp"a/a7n~#1Nw8,Z(w]>F[$ll|onJS4~GN
cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$@$p(S"
   ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
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                                     ?(:$@$@$@$@$@$@$@$@$@$PP('
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                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$PP('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
    ?(:$@$@$@$@$@$@$@$@$@$P P('
   ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P(';w D:tbICn
  M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH$@$@$@$@$@$@$@UXH{[NrI9CjQq$@$@$@$@$@$@$P8 P(&c+W#Fq/l>oF-[f0
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^_mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/}z+VVO>4lN>d0`3>
```

```
@W7xCpp<\=4kQ:ukg|RuSSSs~Z K/MGRF
>6mZa ?IKKw3QFe
                   @11*=md{/Eu@ip>LId}Ye,\IA[C>$Iz\Q${NA(o;pNn)}
9j*)VX:>-(*
0bC
mqF]l?2i$;w.>SO=%wqGP9
&w)9%4AmKN?t3gN>.7xcSN(vD/\~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+ `8
"%\bgbY%ew{,'{
6>8
       "P HHL|{W }t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
usx-.#
g:tampVC tx/#
fIY3fnu
4vXkE^{};Pxqn+NW^{1}-H.92+nkA
!L=Z h([t5>a7 `@_,X UFXmip
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiYjF8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
P7/r//=m{9g4h,J[PB{<n"YfZ08 Y}wj7%UpP*0$ha0${uFPJZG}$]=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K_|0IHHHHHH,h*
GVeRm$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r
xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK_A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
T[.?x# r
O~" @!3JN2U%r {AeS3d
[lq
j%*$/un^[|r-x:)0#g@B,z3zjor091;
y|0D0(C=$2x%p`<`T1M; rB6g11# bXz={CrO$@$@$@$@$@$@;g
H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(_[n':Q5IA0*_fS0nV#NCY_+WsNK]Haa9
8 p~ 1BH
fxC:F8(6b_lLizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku_aqeJfcpA8?$uM[NsZZPFNe!f&X
83
GcX&{`($@$@$@$@$@$@$@
#Jg1q W%\$
@;J?f#W7aW"QF^BP9@R^sa &*`yg$0@[o0C-?)k_
g_hmf8mBL|E(F [0[00v
V~!zCNc06
HQ)$@$@$@$@$@$@$@'Ag3IF24a6N
YSP1e?K(IM"o)0YFw
Iux^'XaM4I0b&*6e^2fGz6Ei=5=aLD^F0[$ aj^!F|LX6I|a1!*<yqtE9g,$@$@$@$@$@$@$@$@A F,A$pu/
N(Z > b)[Kie]pB8::ZL|??6l mu'1,hB4i>xky
uky/Em{O>qk}unAofb8BM`2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq
\%8w@A
E5P_veyk3gbC}-P>kD/oO?
o<LG<G!}7n[;#>@71"
x?(-3\&B8YF wsX9-(olkfU[ZEt'8"dh0 L F={o}])
GKMkf<c360|;1
```

```
,kN{=]$6^^uNh1bf$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC
```

I/b#?F

```
wU0b \\ \\ 5E|rCa`FA \\ R|fFmV?G87|WP\%Bh4PZ \\ barWBh4PZ \\ barWBh4PZ
```

```
\label{eq:w} w;=3Ycd\$rY6B*IhQZQj/@<x(0sN9pG\%Q>:wFFitE~o[6<x7\#:!\%!{xpi}a(@H+D1`6I]"R `+rHH$jQwAxke!<O[*@\%|4lP)IA| ``
```

#0SY4m)fX? TH4T" s?aHHHHHHHQcPJp8)BPY]"\$ {@ \$aUjDdf ORHT

JXDI\$@\$@\$@\$@\$@\$@\$P1 A @)jL %)I9zU0TDb\$

J2dgHLW3'0Ac@@:vd.)X;+SN0 0J `ZHHHHHHHHHHHHHHHL8IW( @IA^ (Gh(G7]!

```
R"@@)f3$@$@$@$@$@$@$@$@$@$Ph(KIHHHHHHHHHH
```

@YA,m (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@eI ,g\$@\$@\$P K]2%"4PMHHHHHH Dba (j%z"&3S{+eGOC7~=e`#%~\*[

tI:uJU N

-LR/

w7Q @&@@?F!?SJ;+M}'ZS\$wL.Y7]'OI;CF.?fhUk{+%&Kzk(A2%HF-XUke\_ri##I4S~]/Z<%"<gy,0}\Yr8yR ThYoM\* @YA'(29t[N{;?P)J[65-[)}2<x\_~Zk\_\$dKRbS

NW\*Kt'Ks0w3xI:%++;\_`gITYnfM)zs

```
:"}9y2{whLf,ZV O@o7x%5A! D
```

Vk!@\*Udn

 $PZ;vL6o,|[>\#=[r+VwY]g_]|(ZtlJc/P[-ChR?XF \ XPb0>\{+l$ 

```
pIt_s !NVTZj?s.3= O#^qNWS~T#
```

```
hy};+dX,P?:H7z-jzB?W(s/+WukWV?F*hs@KqZUuN.^ia{OY%9?fS_y569f#@?v
```

```
v(u.YllO$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<*tRSrMg!>>rAVr'JyYYd1IW
```

```
Vu{IF3~Ucx}z^MY>@>gc7>6Z-R}L{oP!/Hc[v{]&}
```

(^4/OF\$P \RR.]>+ygedYzo6^BxRhuRJ\$~F'EP-\*HzC2"SiiI2WQdRJJUINa1

```
\{8^g*Hv \ "O=6) > sT2Z1 | j \ XjS'db2*Gjl) soTy(Yk4e > 10^3) \\ sT2Z1 | j \ XjS'db2*Gjl) \\ soTy(Yk4e > 10^3) \\ sT2Z1 | j \ XjS'db2*Gjl) \\ soTy(Yk4e > 10^3) \\ sT2Z1 | j \ XjS'db2*Gjl) \\ soTy(Yk4e > 10^3) \\ sT2Z1 | j \ XjS'db2*Gjl) \\ soTy(Yk4e > 10^3) \\ sT2Z1 | j \ XjS'db2*Gjl) \\ soTy(Yk4e > 10^3) \\ sT2Z1 | j \ XjS'db2*Gjl) \\ soTy(Yk4e > 10^3) \\ sT2Z1 | j \ XjS'db2*Gjl) \\ soTy(Yk4e > 10^3) \\ sT2Z1 | j \ XjS'db2*Gjl) \\ sT2Z1
```

```
]m#*U*>Z(N<~BQ.:7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS
```

 $Jip;x \ Jip;x \ Jip;$ 

u7EIFd2ydGHa89,\$@v

```
90 I&<W_y2H:PbL3wy3xC^D+U
```

```
\label{eq:kprne} \begin{split} & KPRne[q.c@!rMJrX)Q\&rkGk(/mN6\]m"K6iEk/\]y\v5B=^6Q>2.rR\ P:U\ LQv*2\#uyX<)cv)n2`Dq5[d5aTdu4k8PM|zt\ OSf;<C+H7o-S\%\ womh\[yVJe`Xn12ro2kB"5cVa]\],YF)<,vntU+' \end{split}
```

```
\q@_i.SUy[?ic}7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2
 PQ^v
9 <> @aV < 0M; mh \& |Iy @A^2/YN - J{ \9^@_dVYU60\% - 5:eO }!Q
~xwppW-8Gclv)j,]AXOWwnfnx&~6W[u5&0aU\nmVw:24L!j%wVgcGLfOVD$]~}gW0cwiJArbYD|-IHHHH
5
 xw=ZOHHiBV; 6n6ydui&iGNoKq2O \end{tabular} 2KL < C. (SSjeL_;f]zss7" > RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{FR}) + C. (SSjeL_;f]zss7" > RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7sS=HuO{FR}) + C. (SSjeL_;f]zss7" > RddCQ[[cM9:(c{H}7s]) + C. (SSjeL_;f]zss7" + C
U]#of.:#Os |BvxKIr AxKPWF
>)`$.*PQ2:DWHzNJ0{R_FiD.urRFvHduS5|E/
`6e.O^=:qk
  <PFV@
:f8wfe]2zfP6??0b
Pſ
O3@WN>*t(\&(*=wT<`s]C!w
a:rZyV3<B3=pPe(mBySn`*$YRB7?N|:U?Z^~c=05*r~SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k
djNE<zJ0`F
[Uiy
<_&
a8OuXV<sup>nz</sup>]0.,||3CD
>*J$@$@$@$@$P\%' p=zSjc ,$F0K*;v:tPTXv+I.J $&0g( oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc]#fkXblm1PGU
YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]Q GdHE}PZ#Od`uG((!69u<ho7Q8(wi`'/_U(m'{Wu-Ve})V)9rb!
v+`A{o!k*OPDG|>z}S Ka$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 $8p+I7o
x<h df`<xl(]AjdWra oI&<Oe73ty#Oh61oR3-
GHWx0?.E9tk6{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m&$x*b0;x{Ktg#k==$8G)3i1u(e)B9Iznxi':.$FtlcV,r~
y? ^v 9mt(b&/ga5tP{'i{w)O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj*rq=::PKzOf
m<ru9)GxB$@$@$@$@$P^nlH@(^Z
 &~-[T|nvYtiA&W\!y9=*/=BtR'6cUum5TXc\%fwy(7WJGaWVeLye @3.v# [Y=r12zU-F7mUV bctRD*
G]1Mx#ERnT,YV.tJ~XKjj+Qy'ty(dTnr;zY'N&f7}wc \0
[])(f;:f2UU7r?XR1_VCn'Td*xOxB1~%0OGcDRd< 8$16-O8gx~I]NaHLC!
(76B \ @\ WO \ gIT \ y_h \ 1y9z \ VrX \ H\& \ Py \ Mae RCbTd = \ 1|ILIi0wzA2xyC\ WT1, I]o = S \ SG] \ LrC_swX6]^Sp]'O \ varX \ VarX \ SS(M) \
R=Uo@?Bv^qQ+eam'WWRrsH]RMyD8G'<Bv:%
 P527GsdP>>K_wg?T.f\8!"V5/oUr>oF%a6#-0QY! !@@pf+$@jE(>>^>} d>9q
D&07]
iQy$X>co
S}x2xX\f<}[5yri2{Y>MdyaduB Wb8BU2y
6}(/KhfSRb,?Nz/'v)#r!f?bF&ic8tl2uz}A$OX9&wIjg(0@6nYP"c@joFVLJ.%wqr*jA#[d5Vm{+7/&O4SI{
 ~O'$5(SS,Vrs~Y3 #@@fK$@@tt6$'{z(!lk7C_"eA\;2d2!_3CX-k>/qA`s{g*sscZ} +#o&/g!L(3JMW=19y5
b4ytW0rkB`ZN<)P?$[>tnQ*-S]';R#BB/1U
f
dYHN s;De-DFFHrrXg/Si_]x.U((#fB 1hVc&?K3o6SSF
 BV Px0eh/e{wy5B$@$@$@$@$Pz)=lH [u/Zv%4win dYHQUrKRdnNt_.=n-SE~<16Q{u\M;3Mf.s
 *HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+".
 :mP!b[zDLUgerJ$ddV_?_s.Q5u@eG_s@>Z&<-<qjo
                                 '@@#f$@O>B3 t[r.o^{MRRRT\r58/FXZi5cV'%gWs\><E~]*B^#W+G;flwPA#"W&Ip,2 r\{+)/
 Yvni>
 ~A9pLyqj>\/.S/y3q5*_A=BuZy-
 BIR!OdEnfNm < :5kBcfcf5O+ji?4J9 < \{ \sim Bv'u\&R ]o?wS, [[UcV*oW/Eq0] < RFec/d$U( - V'oW/Eq0] < RFec/d$U
 $k0D%$9JA;k6ly%u]\KWvy2Y`*w<O9+;;{& (a40`VO$Pzue)rUWo;sg5j!!$-
 nSC + = "fJ(Q(@).hXIR39I > Nn) # c0_H < SOKr?[pCQQN^{{{GkI.}_{f^{T}}}Dx^{(2_{ts})c2kKjvP@BUc1{?L&}#GS{g})} + C_{T}CQUN^{{ts}} + C_{T}CQUN^{{ts}}
 '5 Mid8M~Zu/s
```

 $P|)W,g\{ch/dJ$ 

7s`.w^I4]CT I]{yK}>\_z3e0',[AA,/UkISgt\eTnXK \_#v@y

c|)U[]]"]7ca]^Ei]f9cRop\_g1`Kho{Ms'%)#{#\$[#!O}Nq}Y8q[5o16one<6PyC>{mR 0~!V)\$@\$@\$@\$@H WQ) ( IIIysUwQKSl=K/k[ozX\RYS

```
C@B!o|$o+zm?Q9C.&SQ_>i@U.(S~Y*I k,9BTw$+c{2'pxGWc0V3^?Zw\'iO` #o{-Y38*t%X@8iV_oyQ1T1?j}
```

```
\label{eq:main_states} $$ MY*W3 m5F.epko?V<(|_MG <g^?a_('xD%gSeN_/)j @ U%iSXVMd:_{}+mxxQmCem R%q1n@ #oW}FRJXBi5ko}Y)?4M3|Ux0@0Ka}*\qPXH.W&ZN)NQ(cVht3`A]>kD!*AqLz'(1(u1*F=-8lSo~mwx+NEs8)Bgco8~2n7W:|t4egz8ecM$@$@$@$P
```

Ζ

b\$@\$P\M62p@8q,[L4iz(On]&>>^.rrw

+=

h:J+^\$>yc

 $\label{eq:starter} fqo^n: @Toc V5"iw}Pwp\{ymlm<a0S*3bFU.pwB\{vmuy]F~V1[<;Lui;/h>P=!x0VhM \\ <~\n{%SYtYy(]v$dHilU@ X[*U^P-$;9mf$"$z{ uVUfg3K]ZF-ovlu8S+{dD3}\yU \\ \end{tabular}$ 

J#\_PO+C<DK d,jE]U"SHAgK5`

 $7\_uq8b^2\_)hRBp@\_5Pr8yR++GBfs.PBrT]gjvDB!4U37?c\#820j`?z2\$\{T5DWSIV5eH8cU!asaD1xe2-interval and interval and i$ 

X.=fxFNT1]6! (\*\*\*AO\$P9rDNkJ}cvI]

uhR>U))^AiPR

aPWn^n@\_#.PU@qY/Sa3^

G"

#.)\GI~VSmOiHIZ)O7Jn;w5)3O,C\$@\$@\$@\$P04K -[={;RdtX>l,0vH\87GCK`HC hK Tp,W3WO(TV\' 8O:-?JN[Z

\$zj-r&}

)\$HHHH\*\* #d-

&v{+\$@\$@\$P

ru3a)k>\_32

n\! K{oye\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@&@WHHHHHHHHHHHA[^ F hWF\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@a4QpHHHHHHHHH+.\*

```
n\! K{oye$@$@$@$@$@$@$@$@$@$@&@WHHHHHHHHHHA[^
```

hWF\$@\$@\$@\$@\$@\$@\$@\$@n4QpHHHHHHHHHH\*.\*

F

 $] 5 @ \% 0 m4Y f? \# [J^dCBB ... Nbbb < 0^{*}'Ov]_0. Qu?2] b] [gyg_?_+ - FJi3g \ \ RzuLzIZ_|Q0Rtx_? ^{+} Bi3d \ \ RzuLzIZ_|P0Rtx_? ^{+} Bi3d \ \ RzuLzIZ_|P1Rtx_? ^{+} Bi3d \ \ \ RzuLzIZ_|P1Rtx_? ^{+} Bi3d \ \ RzuLzIZ_$ 

,:o)Eo5sfxvq\kaEp x#Ap? @'\*.t?}x1cd `{O ;CJV<?\_]+h?C>wVSUZUM['f^x~(2L\$B-`lb&8  $\$ 

 $w)) R`P>cF7||gI?j\#AoS3zjyG?J.<:>iq22'Q*T\%|"5*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}U.w+2]|"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}U.w+2]|"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"AAA2a:u}"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x\^2xz|ppkyfZCe@AAA2a:u}]"S*3SHY! T4T[!_\B{x}"S*3SHY! T4T[!_\B{$ 

 $vcq\ riC \sim JIqxW0kXk|w=zykZ70w7f\ !d1m>H\sim m, 4H/_gA\ :+\ P-5W0!_|EWL\ @\ @A_R, G\ P-2WL\ @\ A_R, G\ P-2WL\ A_R, G\ A$ 

M>}e6anq<DxC\*2pBDg6uy7

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B\wqr^W_P!6>GeJqXHk:$r:mI|A#Pw-b7mTnUN8!Fy>32VZe&$f_`\Y_~}?0c-
,,L}Fh#_E`WZ5=aqN8sNa=w<";w:kWAl~'u{NFA0LO?/w!/5k&p,xb=ICCC(=cSGs7FkFy'U|bc\{%@IDAT
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(!xaZJgB|wx}rJxX#)ZF|.K~[}gN3J^S1<kV;>sE}]=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS)Yg8-1)]=3w]a~Sw[I~1HHW!py^7 = 3w]a~Sw[I~1HHW!py^7 = 3w]a~Sw[I~1
p_1JiQFA!3&[W,8ve8ycY"4kX(Qo<7:F;15Jk8s%NJJ>N`D FocvcCyf2qg}
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2)}5c97cOv%\$F0Xcy>

 $lyW:'j(*b'XdD90f1*0e$x,M9.~<NbSKw_i=c\ANoe?~g@o\8-fvx>1E}v$ 

~SXm}TR\$@\$@\$p>.K\$@%`8{D"x cAa3&6yKhv9^ZKMaba3]BIOuPPhP+Q)

 $ac_S2Fm'' < aT''^\& \# < m = >sL \ (q, 3GlGGOqgCj(5OnC2J \ 1\&')x?wfFB[$ 

 $\label{eq:solution} OuOn8UYDN3xS=7c\%,/,YxbxW{i7YsuqzPz{.k[gYXPF<BH.8gg`s>g^_wB!Bd\rSb1.144ac\$FrKZf"DDER?>9>z N{}}[{6Qmu}^fr'|vm&m|f?C}f>}&#@KE@@`\IAj1[GOtfe~Wu]k']_:c?N3;#V36h<~G~F'EJ:`S5<se:Si,6yT{q0swJ}F3'i\$y_FE)l3sN9k"I! BrDg.:tS.KIcrA&3~?/3u$i]y?&(BFJy:#-kj:*37Grivh>OQqqKn^?e4{MgBtg=U]|N`I94/2WPJ, M:mgg7.is[X;\z9rFYu|-yzMRCr`hQtwju?fZt]uy:D2ylu{ |GeZlU;)j}$ 

 $\#3 \sim \& HARVSLa\_C8ulW3 = \{1k@ wmJLurn2Gr'\_t| 4HfbO'i\%.k \\ & A.2 > h|? \\ Jzv'\_v\&u > O7\& EM\_Q3 \\ & A.2 > h|? \\ & A.$ 

 $T:uYIgkO\&=\_MPg>/c'A|gooRI^{5s}Ofy]7$ 

 $n; IH js WE; ?: m \sim s M \ z Ec WwFc > c?_9 |^{uUsu} RGq * D = 15 N. \ JKF'B = A5 mAWM' kMH$ 

L[uX

 $M@ 3!kM\&96u^{LE}>-atgBHkcM:GNCV^{:9}{1t_qsb6}Z<c8w;\%sD:tw,)jm{zr\z(xwOYB\&_R;p7Mwf\V)?dTJu_21pLH (iwd>c<'o:)wy\%HJfm?]o!j}y$@d$ 

s'@jN\*Upk+D^C=)@

 $fXIdFQc)gR2;SG\YR^{0}P=F1jQ]Yz]?qUN\&8ltD2\#6t\&MHV>CM5\P:zrMGKgu\$s1Mg\{J;r3)\U]w?P2)em?wH;\#v])c/r*DNF:wP`jSOG|l(2)o)wtjZ*yP.X]s;a24O|y.$ 

5WY:N << gZTlM2mq

 $\label{eq:sigma} \end{sigma} < O @-X@@|:s3S+MZ\dv]>c:\%5\shNO:d'XGyC5#aYQ9t>/O!kgvgl:P;JgtRKdDhaRv_>u] rmo\Sl6l[;bt3 \end{sigma} \end{sigma}$ 

s2^zsg

 $9_{FN}(SVUG}tsgLu!w')*sR({o}:,!Y'NZ/|f{/~qz/wWm|3P};\o(:iK)wr7wqM|Wk{R4wZ}S;G4g,K1y~L>w&:3Izw oPFCs'F[~n=4\%w\%eiG>]joA~c+tvN|vd]E)ygC%]d[Zr>m>D @`1$ 

, [nY>4yq=gn:t3v6% }FJ%M;NGDJFmPOi:ic.LdF8\*)>2JGnO+sa3<t.{  $VWIgQkt"Kj\$ 

K[#20rJ\_Fwh0A J

 $\label{eq:constraint} KgCD352tS;tsgo]vi:o;zcX=2Wst\%UEOWftOZ\{[ZrEJ${RGuT76(0m\%tN|^]tf&,&Qy{JoiCLJ2?Eoe||i|{eN~'RN\%QtZJ0EOf<M`,7&;IpZ|2BJ~_z{"tHWMqYd}wp~S<M'w=@M2}~{iO{^&Z:3>ik[wt>M'w=W2}~{iO{^*CJ}}} }$ 

 $J;"[5YqN`:d\<\&oUZGI3PJ~geU?z\)/ @" Xv 0?Pff:AN6'>QoIS3\#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QOISAN6'>QoISAN6'>QoISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN$ 

G{:e9c0y>\_?lW7txH\$ytSi):]:6

 $KqFdrY0"L2?A/\#ndULGyJ\$J>9^{>}7v.>HT:kr'@F\{(:,RkYNtLww@"P'M'[tIg3nj24yp,0osGXg8O])$ 

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 $lvk\{vyR|UM\nW\%,eXfYcSs>I$ 

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xI @2AtR.IO) @\*b; @FdNL0%fLX~x2(5ysN5% @ @y

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,[3ely&m# @`@@8wrynD{wtMgZ @I`AhU?\^4s:

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Open Source Used In AppDynamics_Cloud_Analytics_Agent Analytics Agent 25.1.0 Windows 2019 Release 815
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=J0#~.H @ @_`,9CRLsWLI&LnNAgN?s'8o`:}&w$gnZj"Og=n2qaX3q-dDc&fNWu/~d2PKX];
&7 @ @VX6|)w^$PL3HLITK6Y88A;s<1ytULY-1YNZ>uU6(_{+yoNISP @ @
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@y<675gro{Y{[wkYs5s3AiGzD~U?-_hnc^W_]LN \zLfrGE-Oz?!G @ @X
KF7?r1L.#1e]?>w|?`%9w'0p
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74Hfs'-P8mIPfM7mvK.Byf!@ @ @^r;iUzU3> k.tMoy<OiL.O{&X(\_){~)g"#ke6 }or\_tB~e,5]Pgu[G @ @\_oCcy^~(z=yrI'Mj/-~'\_>I?2vmWnr/ &yew/x`>tdZcR"Q% ?VW~7~:IStQG8d^2c0Ae~xM @ @O`Y/W\_o:SVaV-

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<38\vem9#>}Rn?.w)N=S?i2W&u72)i~\}s2as^ziICP{O>LG?QOY.? @ @VX9rM7MjllVSV6@IDAThd}u]'I #

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M4/Y?=@B4EkI]

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@ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<VgU]w]9s

@:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF

rt @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V@@@N:T@@O.ZE@@:Se@@@`<h@@T@@SN@@@U@@@SN9UF@@S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @

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T @ @ @`, @ @ @@ @ @ @ X @ @ @\* P%< @ @ @%, /S#@ @ @U@@Jx\$@ @ @KX@@`\_\F @ @@H @ @N @ @T\* @ @,a%|q @ @U# @ @XK:5 @ @ PG @ @ uj @ @ @

T @ @ @`, @ @ @@ @ @ @ X @ @ @\* P%< @ @ @%, /S#@ @ @U@@Jx\$@ @ @KX@@`\_\F @ @@H @ @N @ @T\* @ @,a%|q @ @U# @ @XK:5 @ @ PG @ @ uj @ @ @

 $T @ @ @`, @ @ @ @ @ @ X @ @ @* P%< @ @ @%, /S#@ @ @U@@Jx$@ @ &KX@@`_\F @ @@H @ @N @ @T* @ @,a%|q @ @U# @ &XK:5-?,[lq< @ @0<% @ @ &KU`R=U=v\{Zr!e]vv+ XY`*?V^Kfr. @ @ @-?OW_W\qE7-Ls)~j9DR$ 

@ @,F)Uf @ @ 0KwwqCZrg: @ @ @`3< w+w~UW

]n! @ @N@@`v^e5(prjA'N[ouo?t^!@ @ fy^{rI'r/G19//C9^,\$@ @ L\*s!@ @ @--0 @ @ @\$

^Z.r7/Y\wum`\j(HO\*5\\oqIW\_}uo~Sl~&.\*,T\_\.:J[@ @

 $z!zg|t"p^{-}+?od+o0_{bEjJ\&X]Z4mjrO3a[yYc/|a*mY}9?r-$ 

 $orGO\& \}, O'1Sl\; rRC \sim = yOXe6^{*}K \\ l6uO|cmY^{*}\{.\}w/O \sim g54; 3|-_yW6| = :|F| \\ F = VOXe6^{*}K \\ result =$ 

~\_m7RZk??g=Yoo'W $\{C=t\}$ s9\_;6M9NwY

@ @IYJ3Vnu[MW[wuT{#'NX-ei^gz

 $@s#|v\&\T<;c=*\sim t9g}F_Um-jy$ 

%xzl? &\$LJ:\_g}o)Cy#YV5T;OgDK|[s;"A1Z>7tU+xT @

 $@N@@`g|^:a85p?h;?=$#G{Q;Q\QF(FmHV\Iwef^QI[*?Cr=Web}) \\$ 

 $1K2t9w \ @ \ @, IyVGy + \ Qz[I. < (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ @, IyVGy + \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ \$ 

 $sJ\&1N(o|\_\sim=awh|N\_|;\_\&55zSuda\&*N||Vdyo\sim[w"#c\%UYN|eO\simCkwK\&BIdh @ @|yJ>{Wt8 l:}$ 

 $l\&=lD\#o?['mn3_b~Y"L:W:^=~u\#h\7q\'yuOoG>2|1L~N)?5\&^WMda_D\&?n^`nL^j"a8/~$ 

 $T8 \ C5wgL9FO > C(/~f^nk\&G1mR.h''/j=^@dG \ @$ 

 $@NHZm|i(\%Ma3R7\#[O]p[$=Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oa%s]nVYF}]) = (10)$ 

@ ,1q+s-%JK\_Zi8lb/Yd\$G=jpJwa[.`u~K.\$M:3bo]z#Gv}+m{=+u7]0d7/ 8<)Ocd3OwJiHZr'\_z&7=I1|\_\_<o~mf+% J=>X}wn5 @ @uaE>cmo{U+-[s5{Y^.#3pF}XwK\$L|

 $mwMoZ \#e^{[N?jE/j]7xy/|W^y^*\sim V} \{E7Z'N>l$ 

]

 $V <= mu < \5 @ @ < eZiZO:zpvXEu6~6gXiR v-5+e]lmm?$ 

```
R\{/'gg <=\!\!F\!\!>\!\!3Z;\!nwk =\!\!Dqz + @ @VY`PUNsM\$[.'/lt2gNK/t7aLw4VM <\!\!le{\sim}ihzpWM =\!\!Y\&k + k'u[n9uRSZ = @ Marcological structure of the struc
```

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@*n?Xm\%)D+-m\%3-I\ fr2oi2wlqkt|$v;K0gK:g\%?,MN>3]t](Z\{ramC\%w6dr\%pG?$niMQ @ @f
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tw]:dsi8W\1_|g9V9W^R ::.{+m8g/2xqfN3} xdJbJ<1M`N @ @V]@@`w^7((ML O~d=P[h)M
```

```
oxCy; os#,lAs<dM?C9/yy> @ @,`yim}3&E`L5nunn+9zU.'A;d~x'=<o); @ @Ysv[
```

gYs2lZM&kj3j<yw&zV{`

7lml&UVH}c+M6|`Y%kG?Z<rFmQKVv6xJ:O;|SCp !yH9S[1 @ @

```
t*UM7;ynvR[oc)_W),orOY3; LxdfV[cLTs=oZ^u]oo}>3N:/iGqDy~fmPdN2iB @ 0;^k5
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?%w|3);v+0{ ii=f4

7.|+[I

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t9T%6_IZ?^sWM<qDi
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/@@:0@sw{Zt4Z.h/zY6oBi::x/46.#8Xxoh5wnu.\bE3^]Fm-(@
@s[{.w)[mz,mL:Cwi:J,G=jhS&_,La%am{KYAJ}N6}&u,OC?4Uw\r-O>> @ @k38y:?^[gLK:LLLTj\sJrA{
mx^VnY7'Eewn6|^Q!?tfy=>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0/|/<o
6O.e < r' < Zw < (j) = gN Gy^T_+ NwZ1 > sLwh+muh < n < mz9v[i|m[jLyX=
 @ @M@@`nnVI{c=v)Wzs*zIS_$Mmnsrc&=S,||OKFN+iw[`~Z7q7/|yX9I'4lpeo=[~T|y?% 'PJ@fN~6t}'}u-
uOovaYgU<o[|4d29tvn--[GY<zGn= @ @@
vYE:\\sUCxFySZ2`zky;YvmHtT/3wu&Ib:o6myTZ+u9&6)9udCh |X9 3|&'w'okL7)@%\2%IQR=rm2yt:k^)u8;
wN;mr \sim [mxp+g]^W63nt[2:U|nIvr-g[tnMys' < S>\% @
@^gJN[l\46,nm:FNzRbwko]2qnFOw9:>:>]Y|yIt(&_yrn>mn55H{hsFOg6`M6i.hF$*8N$BSz= Q E:
@&"E
AE"BMHH ';?{fgw~;39EyI5nY%8Ju70dPH`QXZc5Bkb4)TN+{/K'G)u?/`'tRZ;CsMkD4_~YjtQPX{mw.6sT+J
$80=)<WPpW>8a[DKo=EM
3nG@@@@@8V?p;c
{Pc[5Kv[yiv3TRks%mT(B*hBw(ZTR!vRkykn5y4VZN
fZhG]vY>QP`@zZ-
"4Q0`Ev
`{i<)P,;g-FI}e: Zr.RSjK.k_=OU_+r)_(wPW?I/E{I3B6|*miRI
\label{eq:BR:hNRltn;fgT~9"*+10:O} + (\&8H \quad 6Y \{Q_{PW9PR0TR/(A~^t^n|HW\backslash 1ZNA A)) \} + (\&8H \quad 6Y \{Q_{PW9PR0TR/(A~^t^n|HW\rangle 1ZNA 
a\b:m[l=saZVmm
c,'iYJEIc8?
K-TrHRTn
-]&[oSO=#yCW^ c>3585R>*MZGA>wP, |Ks/laBw0_ME
.w!.>4h^]`pvJYg[iL%me{PXc.T]*i\h@S](ja<Rt;y9MJ*QR
Pz
`ZCT[Q=!.Muz{nruo-Lve\uJV&yIcPpX/RXo*4z@@@@VA?zFes <*A:["PoV;@*V@fRt*W!
*K}k`SD_wuk1ITtH^-0y LwE [n)D2lVmYE5)sujM}k\{LOsZdk@@@@hk"5)yg{R 12cW
:uj]wfm@@@@jC@m'r$O7u3|dZ9O
zEx$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P*N'Y7Zf{w5XXb
{oIr/lxD@@@:I@c
hZ\pA\{B
6@@@@]B@]tn931e!v}h (@@yFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9;G
u-z'O.: z@IDAT c$ !@o\p2X@@@@@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
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@E*Z(Sfmz+!P/|K[x@@@@ P![1fKPnNuj={(eD@@@@\,Ll3ljx|^'(_])
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3WTF@@@@eCee@Vw]pe4K@A\$]?t]"! @45S&&V)6[@Q \*]g\$@@@@hVF@+^V%IR +# Itknk--x A@g8mpVm wxuB@@@@TM@L2FQB@@@R@[j/hve<v}ogY=8v@@@@9

```
P'|j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p)
+XzZ6XsHqbu'loMkpMR?N}*va{g
?r?S^x4`mlm;3OrG;tm{}[o=klWc9&w]&" waj+mq|8{L,/&|]rO7:d
a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:17'Mb7D/o=Tgm _nMc x9~;,h
U3Jn]w7N<Dqme-
f" i%|e0SL{cL_v% B-XSO?Wsy^=Ozal-6cL{k!msfwa; }z^z=[av>=dwf/|GvAJY3%\wUW]f#<br/>b
kG \sim slZq9 \sim ?), 6 l U > = *KH^{$S}
i?~A5@YnP6l!k?t; C![[dw8^5W6zSgnZ:d:D?iQDUi^}{]Z}QgTj^v[?/"Ya2 @F
y)0k,eBJ$k(]B0@BIvwt'z6lM'w`)2xp2{=vW}xnw^=bU/"V^iE;h{)i/p-"N;-
n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v ?m2`g4)yo-370"~|m
Ao{We_IR~e<5>|Vif/cv4
0
V @@LD6>c=Ca {[`@? 8].+ PtOXf
'Ndl%QG
@ }ajoI>x^e~_~n7:{1A0 J`
[K<t"
{/T>)7Ll(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[!!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
FZO5~z, {!m:^B><Dz^{}\&+pIZom[[n^hwy]qo @i}NW]?vGrV?~vZkfg5x}nz`=
4h5ao-L\QyOx]I*}q^KcQ|=cvL?w}]hytV:&e/c|^1N}-PF!~zcOJ
<y?9zva9a-g<yX@@@:._|1rnvRK-
wv%4j{GwL>9K_6X}U/i?>sBj1UV^;a'n]sy7nc6pz7YO?,<_!Plz?D>[vi_/z@>`+Z=3a
\{CG;b\}U>Z
E&7VZfnlGkXVXasI@@@@Z3<4HjL_zoTZ78oGr=$N,z2j!I}f?v'Bv~
A?dv}oNBd~9OnnSjg]_y]o)j)rQjuuu>a
:JM0!~%Ez?LV9Tjm
ue_*T:@,6@7mz}G==&~r8:LO`cv{<>y0
@@@@#DRfi^[6]}WvAs{7dy|5iQ)it0 L*=^|"R:`G}O6y]u
6;;U[n|m<8y<92o{(c+.:cmZOLmD{I=Pj\8%g'.'L;x5@*Z=/i<wx)
~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@
.RE]zC(:?;C|Ja'5
Tdu,^qufh}eAG/8iV6q<{Ly =_4i3lvlsYMSv[OSpbx0`9:G@@@:r_|q{KM^Bljx;uUWY
1
klOIOWd!'Zn.P`_^z{H;l6FN9j*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5:
H;196
oz;k/= fm/
?|;r1Tk,.8!Mnu`____{6*|:Gq4p77m?N[>TbK$!
5W{Wg4(_r~ s:a~~=j5RJPo]/ol`_?Yn64@@@@H<#l
6(N;[lAm9n5GW%\<y/}{i>Pemj![{5')@]tAjS~9_lQw8{?.IS@`u[=9cg~gA5"><XMVy
4&Iw_]gWqa@@@@|.57kv }+N>;^)7?{F^d;mo}mZa_FJ<RxF5d^0Hp26+[.oZT`Bc(-
Bv{CRK_~5oZ[#?yzeIv}tw?m?z~<dv=oI
q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG
dZa>d_{11Hx};+c((G)|N.]^{200}yU^{uh}=6=tma
35OM{Dz])]zi6),[50WWWgG@;=Id@@@vwJs~vM6B=3f'H}9$` yyOx9qo-3g}I}8->nj{%^Kzn4_sXfUW}p6eT
```

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Q??aw!<cvo^qA
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;@A-a:`]rknkZ<D>.c?_:K.Q8=J^SO=UV4f5j}D;L;+{z\B!+~:8s{in|/oWlytVwLz
 &2`x *a}A%+fut)Sk*wMSO?k8&;{Wpgz]"2
;{fwujK
0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B
v?5)yzO'K.}cCWEWTm>xm;'f7[o{eYO>b;#5Gy7J]5xO<Smo%kCoeg{otOfW}a*/MzuAX:B`X
>I
Bww/k \langle vd \rangle
8~`^
;dImJw]t9)b}
|CB@@@:@N!wg
7bSL52PRpE(LiN_w-[1N;l|b&K?W_fW)]^{rG}vp+:o5
<6[m?Onw]wZv] 307>e'+/e!d.mruzKK^L|U u=B=m=#\&\/#/l=2@@@
B + f TBY;)s0qfO?y?5q;
}-Zj_mn!<a7x8fc7fr7hn6xE[j~_vmXqW^/_z4*jgybO
   @#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8*_@V,<('zuYO>uX:=:~
z|Em
f^v!W15-oz-c~@@@@ PK5!Omt+U$ZR@c+.^R\nO_]+
6grsRg~l=9n2]w~zK.wo |%g& @C
=xL3f~S`jS-(0gNBg
~[*;*hV?}]uUvGZy@`!w]r% @@@mJnkw-
EMBt=RYKm;ng!#hx8v&{)b]tQ;A@@@jCqj"2KA5q}&cWAjiu4n8O-(Gd@@@-
u}nOaEK.wheUW.d@@@@ZrL^
mcKuMO/:d}Ikh@@@@ 21%%l:H.]-L4fZ@@@@@zR;I <<g f_ #" R}! 0#xv @[
hKm < 0-
                       m)-w@3g{gZ*J'
'@<U%[|gmQUiW_}v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s}4Fe_|E>}t9ri[IT@|Y=chY @@,e1 Xr%m!vwyvg
Do/x;umege>[j ~e ]P(7hkYf0`@c=>h@N8[uUme]\pAp
onr}o!zvXb ;*8;`&
  @ h1J6;w}>3SO>92R{~Bc
6 \sim 8t - n Ut
7c~gFzg}-{=DZo=cjvA/l.]Vwu%?og[m]|9sBO?pvGy/byZh}GU\`+Bhu~KCv :Z"m*s=8~H;Sa
@TSr-]ae7?dwjj^hD=M@[
uQT{K?O]ZO%5ZkFKZ'W*W@U
@>6zhIl sN U:w}s
-qy4@@ :lhSp'W U6R=mmbKZLw]H7B}?tv5K qA5cu?vu u?
@SN 4(7n.O
z0;C=44A]s9^+h3iZ@@M sk&YD&%jCYeY9n.(gbsP]5y*g\gq?ymqc M6-LVAL^iim}yS5Y2y
*{HclJ5PkGkAD5Joj-w>~jj\N>9Oq?X5M%+/<ukM{@amu}gCD:AIg%0lZyD@hmvqEFR9?~.0
zmkxr^xoBmC-B[}~{[$ j/}.]qsOY;ZW#AF1"f7h#>|xnbMl\n'|GCrHJDji@I>T?y]Ue=OBM[.j;%/Ew94vxM|09F5!
mdkjZx?-RW_~.IrwU*
O[Y^{4Ht}[D.(K['xK^{U}]7]oVZkJN]GmW_m]vBs{:nn?7f;cm%wS6jtF]KU{}
D5ur-*M{X`J'4fKhneJyuS,k~6-
qt@@V^Uc>.y<wNy!A^?|#q{9^pSGmJ'_uXP&/L?^SXr1zt/n^dyx}y@:y<wm?<^xh_}m4_:Y?Oe|2i0O/O06Wj&`asymptotic content of the second secon
Gqn+hy^ QtwC?>fonKn}
wO^W/wMhM_Q\#i\#/+xN'mg6+*t>P^]rd7a$dVg'm;>Cqra.LK?x^@+=+<,WFm}GV>j?K/hO'Iem/+x!#=T7yr@e>
vR|q
^s><pk2^Y0?^OG~<`,.
m^:o}|\/>Cy,{ :-
```

vE1\_G~/qu,(:lkPi-<U<@|'\_\_t [{Y sZl!,@@Z\_@MJo?T0J4?\*&i6T( mAo^ky,,a#G a\*8zAS@ATA? 1it+^S+// U}9[o1Gp6B@@% G6|p^-(((}?W~kg&}pj9?UWA K)k Ztczt@@[o i^5sy~A1WPXHG[01.oYSO=5 :jyW4?^3viI\*I'ul>:~6kHeWsN??nlT\_|Q60!"x./1+a[)lk-U-BC!}<]OTWTX&yn5/~M>VFtR5&dy  $>U^{T}W^{H}+...$ Z O~UNwQY/z0O9jV(\*xkY;\$SeXiDi,W<VP#T!@-uXC"NS@jA}2}~y/ Wqe?la7uT+Dt}1TAV@@J@U|keK5`@4T0G I5CR?TQ?IyajekY>#w^&}dw9F~.pRLLJ{P yP!NP\*k%H\*+2YmvvG?QBtE\~XF5)m y: P1}% ?f LLt8j\*EzX\* +jSkG~xXF\*TT9{ RqB6.)h]zmI0k\*WtRpLt 8Ic5OIRX|e-XnBtJBdige j{Nj>tN^@TQ-3[VoguywwlAZi=]]Ae\_-T3\$\_3i <SK:#-" \*x>SVyT`Wl0/"`V^T@#~ZqItT @//\*ubqjA<j>sux ZCm]1?-%T@Sb7KtRK.lXNhH6 =+@, 0N4/b%Hyv\_Tl!o<N=9\_A%..P lb)v{6X\$"ps^  $LN-jeTN\%*W,pZ5g*e@s6+{Q7/U5eky}P5UV:+BN:(X.{#}>\%T@IDATUT?}S`$ n\_nrIT8KR-W{>c95z:PQ: Pebk}e;-quUl>VEreQdZ/RtTs 3WXy<X\>T|"@\&vV"Rs:'\*Uk:Czy# 7xRyuG<>Zpa4AR5Pbj0/Bym0I /yM0^{5~0Ii91^\$y<Kfx!rJlyuM5=&iZK^`e N#n: 5?A5bMu\$x@|r's^<ws41ymq-@#,}5t:\A`\$yO/9'}y}'W"=0{/M/\_5]z(G`z%81,Mk%uBd{tUBUM8i<`j?[\zaya5jTk^Av=nVrz\*i&O@0L:~Yg'D{5}] @JZ?({YpIU\*uOoy4Xwf{-+%]1QvJY[k03:}%?<A<2pYzyZmP Yq}\$c\$, t&\_9fgyuox|SAw` }|R@`o^@Di]%-T|]7SA[ytOb)oui  $#5Ov)b^{Uf} > 1.Ftij@5+{w}-b|L_0Im^{x}-H-[$ RI(Z]lB]\*|'3uZk>J3c!hv-u.CA CRhV[^a UV[U`4lS [X Fm'7z?o[Y5uy\$l,>A]0]1]cz]83QR7]'VGJ,UgZr\*xlL\*Z?{\*lyzc9p=\,^'9^ '@@l;{pL\*oN|4Q?baK\i ^P  $n+x+j\&{sk}$ -y,lk7j25j% 30k\:,iU)Mc-8/c1mfNKi[[;^~`>Lt-LS+&PTcZ,g)Jw[yUzn@@ZF@8vRN`r%^?Mct~ UXG7jzeRJPozxS;vj']xnTUR)[LRjW9Z[{8:@nBZu bMP+>Cjv^K.Osi1n\*Smuu'

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T`Z_sBM:5T?//S=unOx3jsg6Z]x SoguU5Wxph+v-Uy,*'.W}){/)B+ZkPV-^
+u#:4Ku%@JM0uZO2k1iC@h!-6:CKugbUwJUit^jGTV
?5WI,tJ/~Pj^g^=WJ|mV>mWd_{^[Knj;S /
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|[Bd}b)YW>9#x?f<PQBdlyYxa/(xMXfis0Y k57O@s
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9>F8s/lpz<=Fu}`7Z TJux/yk[9kswWO^{IEljW/p.xkl^^{gB^u}<dk
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 $_{y*/\&L\&}tu{G|9^[/]ofIvR:gxWW"{?u5c'7n7}~7'&y28ze]Oa'oN)y:$7N9~m%(Y @ @ )$ 

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@ P"`Hn\_M'FF!4/-~fk[z=sM6 O?1W. #c{3nrMk:W,:imQK+>}7c

 $\label{eq:gsoP^}; bAZ831^fdM:_Vzu\$->lC@RWFn=1\$mFWn]bL:+=v]|O8`4>V2;.E0O7xh7Q[=pr]M\#"o_L/]fqe|4;1q3,Q?; \\ @ @@.Rs)S_=g1B+ehv's8k:rhv} \ `XbvdkzXm,>9<1gO[neMkLnqrH!Fgz3/?g-\$=Sox?g=c@\'7|!iR vXo4Oyztz,jg p ] \\ P$ 

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% @ @ C l'O.mbk?j~1[]eEZkVlgE'}aOd\^6X]F~q8blVnNkWJ+X>tV>}"wM6J+r#({|mtvXt eYA^9 gEXw8V<
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!zMqLNlj\&+ww5|f|ov_>Tg^i7@k,z'.~)?'o~<yvr86w@=lW;Y.2\backslashv6x:3fG?qE]dwq]qo@@4F
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 $7K\&cfuq1@:?^&Y:@@0E2>lS(|Dmf-C{n{&xN;l?}Zx'crv\v9T?fg~j|m1'/{a%evn+ymNu%(AgmpD_-36|m]<F~\I.e|f hE-Dn$|-{|nZCnc 45<v}Pw'&f\iD)3nv[AT}\g.Wd8LO_/AYv?AM+B @@@@#jLi6,z<}7v>~ ME-~`1_K L=_ r{NwE$9^ggoW]{wv,[nV^x1a;I5fhkXnNvYl<c'~igy}i<~=8p^19SK>j?pXuI d Wbm<_*j<w) @@H/[=q,K?+jqy~{s~a{mL+?$yJgg*K<{1K}w!w~4$]q}I 1p5IO+>> 6j d{jcmuL-Wi~4^pX2<ERV`y4KL@@P@c:V#k5^zbFM^r3{G&w 8mXz,K(%,^=h~6Cn}N=,+ R8W_.fh~vBfd~lgw}9jzOP&CE00a7~7M+R@h~}oO:==?8u2e=g nRK[:M%doo}>C> @@`C'',b/%v1,-(vOMo.$ 

$$\label{eq:construction} \begin{split} zcG[img+V|Ov_X>zWuJ?]tih!gg!!/U&Zs.&3U\}-nv|sCAkHct4mf3;Mbg]p6JE?g|&Ky_wr2ey-@@{ & C[nisOW&lR4nrxoNQe{W_veY.>,oP)iSJr~8^.PoSk_{}[}U2iGquoAfHX{5a.11WXonZ^hMbOvQg%LB}:G&|e;y} \\ JP;f5hNn3Lf+ymeH98pqv_{U'''}@#nuQ}q6p<=2jhCP_)R;_5h''W_&H%W/d]t>V-N+g)P^q#CzJ5b \\ {k^H,T$fq~Gzn=D} \end{split}$$

:i!vP=13)7lUWnXc.M29LWml+VhG%" @ 'j:t`<~ZG+SO>mtvz)XZ<Gl^z\d?=0mz2RK{zy~l&Ct^\WC~t.<(5L+e(& Yxbek/rMkq2dHRzd9|=b19+gd?n6S1@Xq32\_v~@ 8dA @ r\$z,)8>{'mQvHb9c(D1bd\mtSU`WIpNr3Okqm.=}a{kdrK\b`[z:7`nW;ej;.<n-Yb%o:Im KluxvRQD=L]]T~[g'E\:>P9s1"|28< @ @vsoBs~ 64C-)Ss7\&4Q;6[Y]781c}y[]py;]iEUsO[vI^\Oy6,"CM2:V]eU;o;roE.l'tMJZkPg)k7\_F`FNy9jzW2]}{+{Ci ?.F'\_Ly{["1utyAlUD1Z\*u)0B @ )QYh W|O?.GsB[zi = \_Am.?.t^x l[:cO-f]v/ecgWO<&}dW3O0"aX>XmOlukzy]Ng+vyg6(:kd  $ZtQQU?=6w+{V}vMZ[vi'{j.w}!wnYw_-NXvU_=1u^{v.5}8uq7w_UWO-if}-0_ckk^{LN}?_{wo}[wusJ@Wo_if]^{v.1}w!wnYw_-NXvU_{wi}]$ @ %P\_;en>2/6q\$,AaPqz?\/;FGG`g7LK/5/+^`H1A#[v7VV[ehzd]tL+-~Ps{3t5RX F\]f;`>c'xM< \kKjlYbo}8Bh6 KvveXbX[Y]:l00z:wV^G/[~[\*]WPg=4>C k/)@ @ 8yGU:G~ReA?ZK4i{} Hh}'b/ $|.ju+40k>o> 5z3lK)h{6WV49wp@V[9J[m*,$ X &/7n3M s% x7mW3k{9@ @`.'>e.> 0CVAVS=A?\_x^xV\_}MU({DfIOL#vip&O,{iwygX~,!@ 'AeP12Cs<'lo~:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV\_+v-<gJ[# @ @ P>+J 0A`F0 tJ&k. cDYsb<}gq#Gc^;hom `rH-C @ @`&9+F 9sf[h\*u%YShB-dmUWz>4/npX@ @ 0C}6z{QiAmIk3"%\2=ztLb^~e[fePh @ @h !Wnm.CKJJ3-OXn~1@Z+c@ @ 3@]lA+7/<411"-a[@ @ Rv4M|5>,AwH1j&hBFW @ @ ("@%eTw% @ @@mC6\ @ @ `hS@ @ @jC@mR+ @ @ @M N @ @ pV@ @ @@"AM@ @ @ J @ @ 6Ecj SN>c/xk#M @ @";"f<c^b7tvU'v:\sMr!! HhOqL28&2,3xZkm8}z8hI{3?O<>#S]!~ >E @m"@M& CAl;IG}}&O>".ZN<puYUXjO?h-M0 mUW=z!Coo=?hV'l+7|KX=mu?O.0m4lwv)Ur RKnhzk @hYZ7G P}&O?]c +A):AYeo04g'Md7p5vu:.\,x7\_lakUANv[xfcvj/f yA.}1=z?o3aAg}<@O~\_~~nfs8P~x~~VPN)@&M\_!9lwuQvu,HMstM+qJd.M`a7ki+r8ZUI@% s1-T[)x ifw}F?a\3\*/Orxw]v%rUWAUVYV\_}u+!<843SN 221/0d:I @cKZz]}FKtb[ou5k1C[-!-Ac<c\m6@ |IF#n`r#? HYN;-VmK/ ^7zrDq ;`Ljo[g0)Lr @@`ji`A8XZs7WjA}~\)NjUsr:[Dmc47Hk"5Mkuk2yu&>yELX{Jk7We5hnLyn~j/frYykP#\$r\_"{ayrkGqGdc ?|pK-\$b(\*\_;w T:H@}@ 0.v{~gb,|rqEgRu=LU>rK?hWKz;\"L-]Nb}lJ#V,MV=ck bX`kv3<[,se^xrUu1c\$|C=4ur &I'/j{)K.d14M<wqWG\_z(! |G[nPFuh\_{<wWLZ:'pz>o #FZ. ?m.F\_r%E'o\_d'w

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tcB:vcDtB9chY]@h:|UA*|no=cJ)(i)v!!>)({D-A?}{VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt\#A)})({D-A?})({VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt\#A)})({D-A?})({VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt\#A)})({D-A?})({VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt\#A)})({D-A?})({VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt\#A)})({D-A?})({VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt\#A)})({D-A?})({VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt\#A)})({D-A?})({D-
RxKP%#>>p}Deg[Q?[XxC0|tfY]r:?_4-Y2H6}i[n 4Z-r"E(H 2xe
"-jo1.o]tAA gbSFK)GNm:=nhpetyFF))$O
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\{\%\ 8hDK\ s22\ dE\ s.>\ k=+>c1ylVxiL9RA
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iR7JA%ig7[M$e#)Db%-jw{, vRdFSGRrRjU*w?<kx8\J6.6Kf&KiqLyzj)gV4:Vy:NZJs7Rve
^\>=1h4C2YU&{Nq6+i#f'R*XRg<OVQYkOn>TeTVA@2y:Wy
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U8O:1e Mkz^K.#+<#=x>3^\*JsS/V)#$[neXAJ3iV*3 2k~VDKFz* V5W[IgR|RoYvs<;];]R,b\Vs
FzG7:u mQ|F4dps[=>|R/)Yg @u4: @8saTjS<bd!S(wR/+^Yi|^"RI$MEmM7-V,(Ug,_`
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fIA^l"wWE\_c%zsneKKY0\*W[kRu]4\*V3)RifDAJOhwwr\_aj-Q \_{iRKlwGf2`DQz)@[X+AVK=K#m<B0z1{?ok~&=w?4'}mSF{}W z[nLxR3QRyK%|Rl-qVf,>-</Oc&Y")S,;\!1N|@ 0CzsM 6Re>d}\$\*[bi 1?7u)C}q;SW/Hr;rj/uFi/}N%~V)%Rhr\$w@>f'gf/Jk)TZji[dA0RO>&t)t)2\$no8F8=OYxIK }RL[vM|8;aEfhFPctTjv@{%qFAZh\0Um"/!>8;#Ul3Q\*y3bCwZwT`|W?R3S w.tv8s1A!O%ai`tAKm!af@'MA9S @3\*6W]ItTiEzcz &4)=p'lthVrFii\$TkITJt(V\$-9aLzHx97Fjrz4hk7v/e/r^dYjk[orUJK \*A@Ne zd6~@6kbc:Ck] XE/[9)tE\Ri4W=A2hFgd,(H%~KLOV#Eat-ER{b>XOzvFjoPR5>iGs6UWrnp]eReJ fehK\$D3oKQlC -)FIIRYGCEHiMOeT~)N)]^@Tiu[Cs7^7WUso;M]4{G2DjdF@ iFvtlQzk^=J[ySsmK3J\hwFPG+8v[n)t,?bsK)^=1"dMO|N]AQ r%|100n4G8s-51g5BA6H>c<8{ td24H'NSRB3tMISA[.z)r#KP^W+@b =dtA @Z.Z:zZ%CSE>RI4"?r'!ED1R)+"]\*EDJu) EEs1--v B-!9QR4u~Wl{Jo7}rK,>bF=xx)Ys.Qr"0--=-bAnWt #74 W= H1j>k6dD5pGnnn(^34 +zg^pIr&k,n\*osT~h\$10pWbR7rMqRBhDJnqF3ed(3L{`=wry}.yaQ^7)s'u4k!@@%0TBm.G G]VY%F }guVU}UG6-O1tiyeijkpKhOgzR?H54O-WJX.\*QR}(R`RGAu-"^krk7`\r~1=;.P<}\$R]/]T"s+,Iy"cFrK:lC>mV K,SJIV-%`Rl\*(\$\*FW{QlsH^}`5B'2"AZQYX+m0@Ky^V[1.I2[W{gn1(,\*'~kKzvJgeiy>LsK|fP5xa{lkfKUw+]C5iV~w~\_gE Y,\*-Rm;Flt{5;C4HJFZ+djq,P [lE?^>:W"\$Nr2/cJd]`%?%.B()#>R9IVV^y^^ cIg"qU7,(pKwK~\IrG'a qCEJIIPXkP\ax1.:>^>>i=!}j7+'^qE8^wn-DWrniPgN}rAQ|M!2[L|[]v\g4WL<e\aze;?S|x+B?]U+)\_#<PF^:+Ae\$},wYskg9Q n19YVsNtOV7?y]uO^t1=mvghBY}<DRF}Mu7}>nXL\$ Wu-rIzvONi(x3bs}<6w{S^L}]:zJrqg|k cD\*euV&\$;<%P?br>C+i=7^%aA{Z}O~/M1=78}"I?.\_zXz+xZiAUW?Jt?>C+}c8km7v1hl~\_=F m#@URtIYB03P9#%W-FpR>4>Kt@5Pc^~OcR;GnzrN}Rg2\$0)UAvEV-uKiefd%\*Nu-)#b)5b3R!/TiWiB-}1)%CRV(&}N{)I 5}vA7=tizkh /~6[RJ/`DJXf 7+J)}>Gyx/Vs.)G\_'e|{^&R~kuGZzu9ro,7`B!eTR~D^\\ yb>;:~OJ,zdHdXx7;kPqCO:@\$R2gE5Y~2f1lk\+1 -2zgJ\_H'Ly>3!nr`yX\*P b!WdWREC5Dn+Cri"W4c5z&|(6GcXVAc,<?\^ls)#]UMzF)MOXd5aKrcB\o2\$tt\S;Am=9^}]3gY:<7:OZy9TkJd|Ep ^\tn~[>\$sN.W5%uP5>LaWfJWL!-y7z5z%R\*r7~KE[ @jK`Y69O>/6h`5{tod

 $\label{eq:heat} $$H/RT"}QM}XM>MFvv"eBTH)>C>d>yn),1EoS<^:/>z6/yI'^h;N^Q)uUs.KCJHX\_n5-N2JQZ3mLfC )ib[:IRcg -y(w~KW,'N 3#v82F6NOpv(.Hc K}#z/W~jA<all!]Wkq+}WcS' LH : NIi& 0L(QD2dUUw[3wt^B m$@m@6@@']D.@ @h9m2@ @ @@ `9b@ @ @h}js@ PC$ 

@ @ @h\*M%Fy#8@ @ @.\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J`@

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@ @ @h+03A; @ @ @5\$Ap @ @ V?&dIENDB`Screenshot 2024-08-20 at 6.00.11/ PM.pngimage/png9 A<J EnUsI)-V{!77

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]sn$&&%gRtiZ]v'RJ5"e S"7+e]{HHH7hRZ51xYF9a7
L(9cwhz),,,2
'Tr97N<)
2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\,Br[18x'5"31$3cr
SR%19$$:q}uEE:QEt]JJ=[sm~*zn7sQ~6L_/
6u]'III~M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G)_~z<o_U`>z.Ai0d%C~$2gMC9ey'oV+V
uU=OnfmB><32o<ZQ1+W?:WwG:7\Ciy7U;:u^[YT,/hocQF,k']R8/+=H3bDys<5_'#@.x6vcw'JxG>kNm_,/+H
>a8IH<m$Y%Av8]{`W^&L# n-vqq,ID4R
8VYnX1+~)yJz;Hmw>(cueaE0^/BCJa)hBK"""Te)re^z*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF$.]5/_^/.S#/"|N=zB
&Du
7H^]xzu3DK/Tvu$$I`RbE];oms F}D5kB{9MAL ;|cCoQ/I*U[R* I}D!GSw,<yS>{85.%$cc;#u[z,uNPy
iS?BoUB)yv$+nz(U>+GI
HPHTQyNuRSYP9E}~J4*K{7mM=d[/Q?JrRx1iXw>5Hk?y0Y_!F
W }Uc1tEF`@1[nUc(k6 b$)RDC]B/dPpMcG}QsBO-4w6mTG\0wWQZ.erZhh)/yP7q7mN) d!F@ ]*.
12 q1B=OR*n<pCZsHH
rr5w"9NY0Y.^Ifr8&E<\VIJOTX:&?!W)fy27GejjW6OSeo$:b!=<l:mKw&cG:RCV}\:y[N6J/?%on.t00oe2e,)WDwcd
=&0Yej(Q5BGC 64^w?gysZj7F
F\02c;S"##5
a6@C55~xft1+5?;PIabL~~?j 4iDCcn5rkOC(&Nq$6;GI: CP3/'1$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf iqq-
sJFxup*8}0IZyOCI{H_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B*54Bn/k('\z
`yA`rAp^$
ru?h[O < -FVr3]Op > lF
<\!\!B"zn~F.inXU|?"nlD}S<\!\!K~7:>iOOO||D8g^k \rangle = \#Jk*1DjH6m+-<\!\!>qvwUnyv<8]R`<\!\!8zYG^>Ai*w=w#v<\!U.JE@\&
V14#wFlbsB\sim [m2."mW#?R %M > 5R!]Z90z?((C)
uM8hA?
1_`.\XfsAXnc!6~lb=(3^Y9Amq;3F-{je%6.E;,gx|QZ\1!F$7DzyW|;wgh\-TYN[0'ieRPA<>-
^*:vm2>&`TMX0W\q16_CE( CLXXp=\
B > Ak
O\O+k]zC[1g"+Bc\/b+L7[a*<5y5xG%GXF{L<}j{M"8675]3?tWg`i6"rzW~Cn~#<9
'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt$BE4&)O
6q?,$@^qC/>|;
{~9r4ZyUm7L'5/*#}_zB^yQi Q&Y!.tV(_mx\XwSr'wbwQ 3
BE^\exp-?9D0&52-Qw'|P7BKy
:o-;^uh}Mg[!.
6T*z7UB:Go2^+HP rf P<1;KK&<%z~}fxS/(mYp#FR{$as.;/ecAj]xxF-'88(:&
O-. oqoOnO>#<,tFhFzO6ME)f]!,Ai@IO}F+3sw!(\J;J$=o;X"e_,Wwkp]T($q )a+a0B10Nc!20/a-0&0a_010
aL`0`ca?Og4ys25a? >#xf*f}0 w8Pdg1`rIy%@2Y#SoZ|t*)(w0?^033;
>0M7g+b^/#?ff,b_7z>|coF}xYJa^{GPcF`be_`.1>LLufa7azfka~gj}1$&OSC;V0k&f|udNUV tRL701# 1/B -^4qpQ[6
```

@x N7I" #vL8I 1 &m00Y OL`&wufYwfX;1yh0fexfeafeZzff^zI=Q! >|i1>aS3 7nXgxfF`/;Nk OL`/@(b0xg< a5yk =!\*[x? />yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa >[|w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad% LLG,;&bkK!rK\$)o\$\_BrKHB5aFVOF#'|<\$x\$qew a>vaYla0/a~&?~<x[&;O\_:v"EnLJ<hY>^g;11In|vGK2lf}Km^I\ihcM6?djoK{O]uR>Y#BSofx >xvo|\$wRR34Z{7%Gb G1\_]7{t YY>&

 $\label{eq:2} zHy7ePLqiS=!113Aeo~p\%:_$\% fNLdLrRb(/KR0)QK\%:*A;:L@BhNV;/$rIhpq;,Z..FGq0|j=*%hj%1tCLXpB3be$+ LtHsYlKBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\$KW6}+E".%iEE JttOet=uP9r$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu*/A;J*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH_sRZSjV3L*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G_h;vJ.WIS$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/*/-qZ*$xGi{kU!=nNs.i} LO>%KX\vmoT0o3&w3v.JHp${%9N%t5X@x?9TS7L[7]BQ"48]Q>yt)E?Ux*R%:YIqz^[wyIA N$:9hC:IK%"<\=2h{Zx#$gD} )WS6&@Lx}_+Rjq rcP6pUxXDt$ 

 $\label{eq:constraint} tx_0\ensuremath{\sim}\ensuremath{\sim}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{<}\ensuremath{\ensuremath{}\ensuremath{\ensuremath{<}\ensuremath{}\ensuremath{\ensuremath{<}\ensuremath{\ensuremath{<}\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensuremath{\ensurem$ 

 $\label{eq:sonward} $$\circ\rM/g^L#4py;gK7V|8qBN5$$ 

 $\label{eq:cmp-A-iKzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55j>8/c%Kh2s+Sd\%}o-Gg\#GW\_.=n=S\#}wMEEEK1&0K+v.]/xuNM~3]0k$ 

 $ERjU{+}8{+}Z{*}UJc\_isCd$ 

j(c#}{9YpH"bPv[u|h5r;

 $mr|A^zOzin/X\{wg|sMtAfU.|\}d^*m6OYFw^]qRX1'DvNCs6n1@[8\&n2]39O]=Chm\&0)[I2ug?<6])T"""hb$ 

=z $7jHEC6h kt_{=}{}J}Yuq3iBtEi2e/e9R_}Y5o.+WVC5lPGKhYAP3g0[$ 

 $Kg2*m \sim e0m \sim |ma3 < 21\&MTSO = ke.k > /|7jiyLS`A; \{O:v(7x5k\# < /> @^u-7j\$z--S2dxSLyjm:6*? (0.15)) < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15 < 0.15$ 

@4Cz!)\_';zbPqc1cdK}C,042@1v0F[v\*:uR1D00?FM|FlsA

icuZlask

CI1 ZW\^#3x |G94i0.qE9a'\_|Q@0@P\.RT

 $D; vnT_V_v-1b@; \\ QYBiOOXB/>xB#c\r.?PQ0`5gF]mFg8$ 

 $Bx6ia.nY_{qA0} wQQDopRbOo\#q+@$ 

`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T

1~\$/D4yqD.XgB6\_e?&wWpa>|;6d #N~lFn8\$vqC5xmb@ A0&=4.DYVZhX\*THJ1PDhQ(#]fIQH

0!BBi]kB@h/k0cSG\_F\_PW+c;kyK;1WW\$OFc;rrI4y^-~u`h1uF

 $0/kx.l\#_5@{HG(c2^*?u!@x/0^;<?99189r!bM)Nq_1jDic`V2c<Vy[<TzTI$='!y$SL\!df29fy80Bca]70}$ 

aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010

][opcK^NyB

v\*F]vm|zM/[n

+SX1cG0@;CZl)5J>i)RD\_f<M6vZz,ukDDD]w%

 $aL`0N\%08?\$0G\%2\_^aal:|0c`0`ca0/a~0\&0a\_010$ 

aL`0`ca0/a~0L#xUVyKgruI"EK>nV2dII."Tk975kz0;d#Hppz2k,iws+reIk2bITT )))\*=xw 0Kdy9pzyFDz>,\_~,XU=q];]lS.]n\_>a,0;er-Rrei=ZsqTTI\*3gn{I[7INN'|Rm+'OmqqqcG.9R>\4i"=?~<RF \$G=>n3r: ]3gSBBB\_k~[~IZlnZz{s=ZF{aFvOq2qDcI]e1jN:uM6zj7]dIOaDgxb]mn`1KUl\aZjic=o\~Z>}k;,Y"k>=!5j(TRZW0# [38r4K{{^zy<.e+(P.'|P3x ]v

]&:#ZGNogy~

 $i \# qyi > gg v9rxLeDt[zx < uv]^bqBn]1b.;"q]G VZuFzs]waFv\% = JeO X L.?$ 

%6KLL Wq2`wK;g:G/z66l +W5\aQhtE{\_}^ytsjy;wePfrB

\_hhOW\_?\adW\`pm8wB=|L"'OOE^G>

 $h|GENkq?r\-s-)+FUTnIaCh\?\#$ 

eG`/FtIjpGit;2r9so&

 $bm?qs>pq{fv]sf6oku(aFvB=O|Bx1< yRYf^x0~ozWf"s70P7< zBB ;J2"zcygtoY,]TFq*zBy!"""4aF1bgw/5gv.;Q9)Sg{ *^X'MNtc=58^g8_Z"??yd]v{"EN4t} }$ 

Zc"#zK.6l}Eo]LUIYZHC%K0'Y\$cc<

 $.g8y7xlsD3{<}xP{-})PnSa{+}g^{}gT_jU$ 

7sy:"}{#`?Cdzk1^u BxMx-m:k08.<L-[j?P}C/a, -=TVM{uV6bs;~n+vdn0%N:nAT17eLl08"30?a0&0a\_010 aL`0`ca0/a~0&0a 010 aL`0OLLdR"G ad@d!2a;%s;@w+wy}3eliJ4|Wm\$gd'uS'Pv2P4|H/H||waF

z0x?")IoK``Yp4lX\_9t|j4mP f2nqL|349ai#6rDEE}\*.44Dv9q<cG=/(N?-{\$,4@J-

RPL<~C^9"%x<wk|<nkHhYtiS.|HySad.AeKAZB+]#2"4x1F6I-^L?L,Zc?|X]d5S^w-

\_;iM7\/NMIn\rt?~o>UqQrGG6KrJ.ye#6eI.ykH%V)<54&&d\$\yQu&G."i0#pG+/]sn4n@J\*)Z\*V(/2zOS9x\*x;^y)\H= &h>11ddsK\_-RXohhtpHagXd4hwf,>="qP"X;LdCA

 $cE4 \& yUdJ*a \& 0GQ5a*@; 88Xn-v_pJ2e-+V= \{eZ2JbRo^_j>/. Bxq(:Yn*|g\{,=^8Ni;Q2nGmKUS\&gm]`g_-5-intervert and intervert and interve$ 

 $[doM@\o Iev > 5WDg; \#5dGu-2uL[bcj] 4GRF5C \sim QR\%$ 

W>GvkDHDXi0B>-K'cc\$"ZDh#t"K2eR0/9xVNQ?

۸

 $\label{eq:started} 5U]Hd|R@~Z\#'';\\ 6zEyQzF+^$$p/VTV,oBTx&5M)ZpIJNyr;y|)Q<X6iIOGD$8(@NHp`(+7%HJC8QY-A;Ud6nO;eP^~'5s0:t4mR5Dt/+VPPAk*73BmI~ddYagK0K?aZK{nKY7|-~wXby\Y#Bps+Kf|5jwYt^{}LL<Y9|8]v./ccc>'N}x0R`#Y~KLLzoO%?>~XY?^7$ 

?f6m|@PZ30-4z^KR

Kw\_EYCz;>

 $\label{eq:comparison} 7m \ |\ w!C5WPbJ~sn\#Q5[>izn:\]E](~e:Bznrf=(Mn?u~qlO>=6.\] \\ \ (m\{@nXmA5k\&svG\#c<zhI\&rj>q`)g?F\&M+R'al) \ (m\{@nXmA5k\&svG\#c<zhI\&srf=(Mn?u~qlO>=6.\)g(marine) \ (m\{@nXmA5k\&svG\#c<zhI\&rj>q`)g?F\&M+R'al) \ (m\{@nXmA5k\&svG\#c<zhI\&srf=(Mn?u~qlO>=6.\)g(marine) \ (m\{@nXmA5k\&svG\#c<zhI\&srf=(Mn?u~qlO>=6.\)g(marine) \ (marine) \ (marin$ 

 $= \{MC[j.c < wUK; o < PBonM:u? + BG:t([n;u(~PtiOs+1F7oM@-ZTo)S$O < 1r-~?_G7n8\}j\}1, -[V[! < /R > | 1B])\}$ 

 $3L: UGHioJaRA\_^{K:mNFd\_A\#}$ 

 $5 jwO < KD'_7 \sim '_aVtMa, \\ QF00a, YRsW; \\ WK = oV7n1xkAz8P^{F}S5k[H \ s5zN.BQG; \\ var_{1} > 0 \\ var_{2} > 0 \\ va$ 

W>N6#;#G]C[oz-Zq~LgqFon#2<Q8?`ct8q1hy>-381#Gj;vnIvy#iFcq~.38MuyyK.g:t

 $U\{</1:gdxq1z8V\}3gz>cHsgK|_{OqFG}\{n\#zKc,=7|W^{"}=zwm5kmr=\}/\{6m=mqo,YSOii\#G4?m'7nlRIs!m8Q\#~gpy\}$ 

G<GLuupZ;qxziy[g H\_<!xS i(^<>qwB\_pnU

BBd<IoF #\9QIH6^7Ot%\$7EP0d s<G

 $P7 <\!\!(m+Y <\!\! 0 \# c7m\%\,D = ?u! @> Oyk'xNBB]y|LH'7C \sim \! i \# dJ.O^&Cixn`A\%^O8A >;`i"o>$ 

-"EhyWxLxsxx^C{9q[P>+H:n#nd;T#A?b]k#x6j|^xA'

 $0"C{\sim}gtMFa`H1/yzJf$ 

gTu"O(! o@'i#u =M~SO

 $\label{eq:cpl} $$T6"D?_Oj\u!l.S6hBu62m@X|t?`hB$ 

 $z.0 @l='y/!)nj J{1XO=6E8K~pFN(Iz1h;9AC!Pnby BB~?5KHs7GH}AHuw0fl?P~@.#6MZ2cQ |;7<$ 

```
m9~rI?7sk%Kr+x Y+y|6'-v"_/g.gB|-35acOa~fNxd=:Pdd'Z`!R6Hw7*%^6$/'>9l&9 LC1pn7d|aa
L^0^ca0/a~![amyR^-?L1ax]
;w;w9|.bWHr:i2IyqTbrvOH$wx8M=U;q+2;<}}aFv_q
XfI}'
[Obw(T_]/>\#9|zM3g_a2_N~7#i72O=6.E>#<"}yT>D>&/~uTH?9uixrec:
Mi=`!=)_Wk#EqoA-6nu-uOm!.%i~jB&2]@
IIzIzu]-W }z ^$wxyryp"GM2E
Ge/T|yy0}}qZ`_%TN:/UK0L`xyq_u4i@J*);]#+U;?A\wDEp1Iciz;(RL6SAL1Yd:{DGEKj~4j}r!M,{C2D=|`9,r6
t5MEHa2syJGU^
0L^C
U
]e!s]wHV~WJKSyE4nYBBN{za}Eo<Br+r=#e lc! ^eD9}:{My0yuY%}ca )+-Y\>c@h2
t0q
u5ixvCGHUeG$)9IL!uui+D+Kkz^I'xdXG`-6'8KrF2`T,Z/0^8)2}Y)ad_></ab_V&ul\\kmygzF}"
}$4$Dj8BA*2_>?RW";v5B
Z5'IIRd 9H*%**ZVVECR%5O.AArMv/})Q<X6Lbe9h" g ERRz/g{\
)W$2w#QmM?$^:nX;yOaW8)ev<jNd@3}Gyv ? M6sM!z 7EpfNZjWR?x <+[3eFv& P0H?aZ7N6mJ}23v%C.e
<WwX|=zu|/Bps+KfinH|1bwy`B)t>mO?T:v!|,]zA o7~k1)0C~X7n<et$&&F 9xccceu#spub1e|' !=qE9~|7 v/!`/ >}]
O;oJ#G.CGJkZ]((ml-#H2<,\~'izr!OHuqet&nLm#,PO
Gn{)4n:p>}{mq-^X=\#{nF}}
?C.R{{:~^0cKfuxta\h.mj52qD+uH#9sB
w'+V?:cw!Rfs,<,X@=
H[oU:?~\q
s-{7[.
6+"fR7i$yFcz5X1]m=Z-*k~/"r_!!*T-#?\;v|7j`=[2sL+F]tE2uTv@9mAzad1<x
Gix
fN=n6=^{Kj+`QFj<~mm?33g}gz<'OP5jh~ys=6WqZ72ZM#GrVsL~2swsx9K-r.r/;b;uS}s1
 zHq<|A=~K98fg=z(sUW]er^r%2a='6l(oQv? F;:~b&} @ cQ;+VL
?oYnMxbFwi*"}U`yR-Zf[n-/,XP1KZcRc/>wu-812&-!!MP`6mj/3,S1voyBl2r #vW/mF"E4D6F]t}9sf;
xuZv5pp~3=n^{("@/<)}*\&upVi}GO=
O<i8^pa<!$#(=o>I9CO 131'0 !,~\^CcZlqm3~kQ?F5?j_0{L>
1BI
c`\0Dw&0Zh'ChyvEz)2G#!bL a`[GF1P!eaSFy<;m
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@|8zKm X+V)^ ?xt-p%noGx0@rQ_z4G9~\",8j(bc !ad&ui%8BZ7
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e'iH[f ?7
gfXYi
p:wFNxM{6}gwczK7]ZOzs6dGU[_W
#=caq0&0a_010 aL`0`ca0/a~04Ys}5aha6Y6ad'L`/g-0G<'a%HN>a`
0`ca0=fIENDB`__substg1.0_80030102*]__properties_version1.00^__substg1.0_8012101F-00000000<e
 __substg1.0_8012101F-00000001<f%0P@0@077
77P777%:
U<sup>*</sup>.@%ExtractLanguageEmbeddedUrlCreativeWork_substg1.0_8012101F-00000002<g_substg1.0_8012101F-
00000003<h_substg1.0_8012101F-00000004<i_substg1.0_8012101F-
```

00000005 < jOOFDetection IR ankerScoreUrlExtractLanguage 1.0 Embedded Url 1.0 Creative Work 1.0 OOFDetection 2.0 Embedded Url 1.0 Creative Work 1.0 Creative Work

 $IRankerScore1.0\_substg1.0\_8012101F-0000006 < k\&\_substg1.0\_8012101F-00000007 < l\_substg1.0\_8012101F-00000008 < m\_substg1.0\_8012101F-00000009 < n\_substg1.0\_8012101F-0000000A < o\_substg1.0\_8012101F-0000000B < pUrl1.0$ 

# 1.44 microsoft® windows® operating system 5.2.3668

1.44.1 Available under license :

> sA

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./01234567:;<=>@?EBoCDFKGHIJLMNOPQSRTVUjWXkZ[\]^_`abcdefghilmnprquvwxyz{|}~Root Entrya
F^Y@__nameid_version1.0(7Y7Y__substg1.0_00020102*__substg1.0_00030102*
-.013478;<?@BCFGHJKOPQTUVXZ[^_bcdkltuvwxyz{|}~5YGFQ\;TF
FF##]h2GULN3AAZk3z.B{yTk?@0GZ+: aB@o:0FJZxPc_(P]
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7% D6C 0zih

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NetworkMessageId0ExchangeApplicationFlags^X-MS-Exchange-Organization-ATPSafeLinks-
MsgData@AntispamSafelinksIsIntraOrgEmailFEntityExtraction/ExtractLanguage1.0>EntityExtraction/EmbeddedU
rl1.0Bx-ms-exchange-organization-
 authas: Inference Classification Result Client Info 2 Current Message Safety Flags Entity Names, Header Body Fragment List the state of the state 
Has Quoted Text \& Is Quoted Text Change daccept language 6 Conversation Index Tracking Exdx-ms-exchange-data and the second se
 organization-originalclientipaddressdx-ms-exchange-organization-originalserveripaddressJx-ms-exchange-
 organization-authsource,LatestMessageWordCountIsSignedIsReadReceiptPx-ms-exchange-organization-
 authmechanismBInferenceClassificationTrackingExTeeVersionTeeNextScenarioTeeNextPayload.EntityExtraction/
 Url1.0JX-Microsoft-Antispam-Mailbox-DeliveryBX-Microsoft-Antispam-Message-
 Info4InferenceMessageIdentifierNEntityExtraction/KeyPhraseExtraction2.0, x-ms-publictraffictypex-ms-has-
 attach,authentication-resultsNx-ms-office365-filtering-correlation-id4x-ms-traffictypediagnostic6x-forefront-
 antispam-report(x-microsoft-antispamXx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-
 crosstenant-originalarrivaltimeTx-ms-exchange-crosstenant-fromentityheader8x-ms-exchange-crosstenant-idJx-ms-
exchange-crosstenant-mailboxtypeVx-ms-exchange-crosstenant-userprincipalnamebx-ms-exchange-transport-
 crosstenantheadersstampedNx-ms-exchange-transport-endtoendlatencyNx-ms-exchange-processed-by-
 bccfoldering@x-ms-exchange-crosstenant-authasHx-ms-exchange-crosstenant-
 authsource > Original Inference Classification HGriffin Inference Classification Result: Inference Classification Reason 2Classification Result: Classification Reason 2Classification Reason 2Classificatio
 assificationDiagnostics2ConversationContributions,ConversationWasFocused4TriageHeuristicsFeatureSetBGriffin
Triage Heuristics Feature Set: Shared With Me/Has Shared Content, Focused Inbox Model Score. Shared With Me/Has WebL Score Scheme Sch
inkDarwin/Url2.0@EntityExtraction/CreativeWork1.0xEntityExtraction/KeyPhraseExtractionPosTaggerTeeInferen
ce2.08BigFunnelCompleteIndexingEnd<BigFunnelCompleteIndexingStart,BigFunnelCorrelationId$IsPartiallyIndex
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   __substg1.0_100B0102*__substg1.0_100C0102*
 __substg1.0_100D0102*8__substg1.0_100E0102*
2
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QpbuTj !#
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yz%h '5>d7
```

## \$uK

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130102*
 _substg1.0_10140102*!_substg1.0_10160102*"_substg1.0_10170102*#6
9-?l; ?jIGa 9KNb. ?AOSEJ#/V S
QK
.D&:xj@k]C#
4 'u%C_substg1.0_10180102*$_substg1.0_10190102*%0_substg1.0_101A0102*&_substg1.0_101B0102*!'
_substg1.0_101C0102*(_substg1.0_101D0102* ") _substg1.0_101E0102** _substg1.0_001A001F*$+ t "2I #Z,
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3IPM.NoteLicense URLs and Parent component details for Windows 2019 LTSC
imageEX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23S_substg1.0_0037001F*,_substg1.0_003B0102*#'/_substg1.0_003D001F*_substg1.0_003F01
02*&(2PDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-
AMAKOTHA@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange
Administrative Group
(FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f14858_substg1.0_0040001F*5<_substg1.0_00410102*
%-6 substg1.0 0042001F*9. substg1.0 00430102**,;93feee6a76ad1ba6-amakothaAman Kothari
(amakotha)@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)EX:/O=EXCHANGELABS/OU=EXCHANGE
ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYAN substg1.0 0044001F*=< substg1.0 00510102*+/> substg1.0 00520102*A substg1.0 00640
01F*.0DEX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1_substg1.0_0065001F*E_substg1.0_0070001F*)
9I_substg1.0_00710102*L_substg1.0_0075001F*24M485893FEEE6A76AD1BA6-AMAKOTHALicense URLs
and Parent component details for Windows 2019
LTSC image6G~M{nHEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDL_substg1.0_0076001F*N_substg1.0_0077001F*37R_substg1.0_0078001F*S_substg1.0_
007D001F*68%4$T)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYAN<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.pReceived:
from CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17)
```

by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

12:38:28 +0000

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version: 1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

 $X-MS-Exchange-CrossTenant-AuthSource:\ SA2PR11MB4793.namprd11.prod.outlook.com$ 

X-MS-Exchange-CrossTenant-AuthAs: Internal

X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:I;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

 $\label{eq:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphere:sphe$ 

 $\label{eq:hccFvXbdz6wVb0lIPJoTj+hvODA6H+5w/5lkeHyjDH8rLrkYzgMlhc4z0IRHKF3JYRj4G1q/mtp7NiOCefO0EhaR QOv/YAb1kA4lilktmeCPE0aJQla3OSpqk83ou/ckCnMkZ2YRNGYk9A6vqGF5etofmlq3F/8dQSALQMkXfn4EcO 864kWc8GBKcT3jXx3kbM1pWAJDiTsIIS69yFi4DBJKB9jK6+myweLo12boJhphpDLF2ev77knTmj4ApoNAb75 gOIOofPOdIja1q77FBx7qq8Y0sX4RYZBvBrmIeR56lXesU7kmBlGa/eHcSgqNhg9hKaZXVZC3Grl9u4Fp4Bm0M Kugp2QrEAAM2aNn5pmvb1UVXR8+stxZhc9e7OBLFLXYC2hqWknvkWEetYmKRl5zvjlUfXtIIYLBRRPYGHc 5GCmlLHcQ==$ 

 $\_substg1.0\_007F0102*WQ\_substg1.0\_0C190102*5=Y\_substg1.0\_0C1A001F*\.\_substg1.0\_0C1D0102*:<]rod .outlook.com>@B+//o=ExchangeLabs/ou=Exchange$ 

Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f1485893feee6a76ad1ba6amakothaAman Kothari (amakotha)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA\_substg1.0\_0C1E001F\*`\_substg1.0\_0C1F001F\*;?a\_substg1.0\_0C2D0102\*e\_substg1.0\_0C2E01 02\*>@fEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHALX LX

Salil G K

 $(sagk)\_substg1.0\_0E02001F*\_substg1.0\_0E03001F*1Qg"\_substg1.0\_0E04001F*h>\_substg1.0\_0E05001F*B$  Di

Marimuthu Malayandi (mmalayan)InboxLicense URLs and Parent component details for Windows 2019 LTSC image)EUzgbOSIq:(Zi%:(Zi%\_substg1.0\_0E1D001F\*j\_substg1.0\_0E4C0102\*CGm\_substg1.0\_0E4D0102\*n\_substg1.0\_0E4E0102\*FHo\_substg1.0\_0E580102\*p\_substg1.0\_0E590102\*EMq\_substg1.0\_0F030102\*r\_subst g1.0\_1000001F\*JLs:(Zi%:(ZiAG~M{nHHi}

Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

bLZFu\* rcpg1252Chtml11bid0 'ch set0 PVUUQW2U3FYkcu ;B7 134R`cP dL364 \*\9 < x:o="Ipn:hesL-m `so-]m e!"w /!?# d"m#@tp://U#.\$'.!/!/04/ (m"&Gw\*`.w3.g/TR/REC-40">cAead+k -}6\_\_substg1.0\_10090102\*\_\_substg1.0\_1035001F\*KO\_\_substg1.0\_120B0102\* \_\_substg1.0\_300B0102\*NP< lna#@G at"0 t#@M\$6 W% 15 (" qPum)+ /s0tyle4//!-B-/\* F! Diti \*/ @-fne 0{95\$ ly:"C0Pb!0h"`9 n\$`pe-1:p023=06==a`}8{9:A0\$`</=310pCV>7qSG5r7 p.M!PNl, liFZ}PvFX?\*:0cmA?#z"0yB.00J.:A3",sqKrAm!P-Gg0p#nd1SxO1N|?pP#!`ngPg"0EN-US>a:GnkFs<FRHypTHO!y5c-p8@; 99A:#467886AP-08a:uP Ue>TcED17UV5pU:U!P0@1!p=KLMX%P owP>FRChpEau\]P\_@ - ;J/K?QR>

 $\label{eq:R2score} R2score R$ 

8w^/A U aG.u8avWebPFPjQDE12#P;{C 1 L"FThi2P w@00o8P" P II1 c3 !LTSC pj\/zr \[/\_o8,0 hPf&D&b.cPck'r/\$'\*Pa""etldrfw0{@HYPERL{K `ecAdP?wra+&nbT`X'a@/?3 w@!Pp" 'Mo'M??/?Oog\*b'\5 -P/w`Opl/;!Vr-O\_nO\_o@?/?O\_oI@'81RPIw0ry T\_oT? ?//?O\_! ,-#?O1OO&'5)\*,0.//?@aS0@Ocx`ppZ`jj1PX!\_1P./?OI?JOK\_15689:/;?<O=\_>o?@W?BC[`r^Qn"-OPQ/R?SOT\_UoV\XYZ[\]nOoSSBOM: a!o'@33pp13/@L|d 7uvw{|}fo\_oO"LM\_P0pstpHbNpxkduG-x34390267}/2pp329183d0mqlb@xy~/?O?/?OVPqeH@kwg`4py

Fr?GAaF F

 $\label{eq:constraint} $$ quFH_ohpks, Awn_obOc_doeghWij0/vSg5p/dy"74 < SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com > bLTqG009 $$ an approximate of the second seco$ 

js

+QWY 13579;=GIKSU]'?"B@Q?\*%)-ACE2[:B/Marimuthu Malayandi

(mmalayan)\_\_substg1.0\_30140102\*\_\_substg1.0\_36770102\*IYJ\_\_substg1.0\_3FFA001F\*<\_\_substg1.0\_3FFB0102\* RT@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-

MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA\_substg1.0\_4022001F\*\_substg1.0\_4023001F\*SW\_substg1.0\_4024001F\*\_substg1.0\_4025001F\* VXEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANAman Kothari (amakotha)Aman Kothari

 $(amakotha) 8357352A9AC74291872DEE4575F68898\_substg1.0\_4030001F*.\_substg1.0\_4031001F*U].\_substg1.0\_4034001F*R\_substg1.0\_4035001F*Z\R-MMALAYAN8357352A9AC74291872DEE4575F68898-$ 

# MMALAYANAman

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*._substg1.0_4039001F*[_<_substg1.0_5D01001F*$_substg1.0_5D02001F*^`$_substg1.0_5D07001F*$_substg1.0_5D08001F*A$_substg1.0_5D0A001F*$_substg1.0_5D0B001F*bd$mmalayan@cisco.comamakotha@cisco.commmalayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt_substg1.0_5D160102*_substg1.0_5FE5001F*cg,_substg1.0_65E20102*_substg1.0_65E30102*fh_substg1.0_80080048*_substg1.0_800A001F*emX_substg1.0_800C001F*h_substg1.0_800D001F*jlY(!eyJJc1VybEJlaW5nU2Nhbm51ZCI6IIIsIIVybFd yaXRIVGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hFZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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"@context": "http://schema.microsoft.com",

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"@outputVersion": "1.0",
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"@source": "Bling",

"BlingDetectorType": "ExternalWithHints",

"TextLength": 700,

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"LanguageScores": {
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"English": 98.21429

},

"Language": {

"Locale": "en-US",

"name": "English (United States)",

"BestGuessLanguage": "en",

"@type": "Language"

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}
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}

]InternalClient=OutlookService;MacOutlook/16.88.24081116 (ARM64 Mac OS X 14.6.1 (Build 23G93));[

{

"@type": "ContactPoint",

"@context": "http://schema.org",

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.url,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://hub.docker.com/r/microsoft/windows-servercore",

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"url/urlTextSpan": {
```

```
"@type": "TextSpan",
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"beginIndex": 0,

"length": 53

},

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"@EntityId": "0d787665-7b59-4513-b6bb-c5914e04f509",
```

"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=0d787665-7b59-4513-b6bb-c5914e04f509",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

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{
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"@type": "ContactPoint",
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"@context": "http://schema.org",

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"@entityExtractionTrustLevel": "Unknown",

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"@outputVersion": "1.0",
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"@schemaOrgVersion": "1.93",

"url": "https://3rdpartysource.microsoft.com/",

"url/urlTextSpan": {

"@type": "TextSpan",

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"beginIndex": 0,
```

```
"length": 37
```

},

"@EntityId": "a462621e-0c87-40d4-b609-0240ea9df4be",

"@ correlation Trail": "Extraction Id = 69770f 49-18ba-42be-94f 3-86839 da 8be1e; Entity Id = a 462621e-0c 87-40d 4-b609-0240ea 9d f 4be",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

{

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"@type": "ContactPoint",
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"@context": "http://schema.org",

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.url,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://www.microsoft.com/en-us/legal/third-party-notices",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 57

},

"@EntityId": "c5c5602a-d6cb-4f8e-ae60-893ce3f4b49e",

"@ correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e; EntityId=c5c5602a-d6cb-4f8e-ae60-893ce3f4b49e",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

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},
```

{

"@type": "ContactPoint",

"@context": "http://schema.org",

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"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.url,52.0.0,2021.5.5.1,2021.5.5.1",
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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://github.com/microsoft/containerregistry/tree/main/legal",

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"url/urlTextSpan": {
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"@type": "TextSpan",
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"beginIndex": 0,

"length": 62

},

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"@EntityId": "13565f67-aa5b-4875-b270-a914e1e2f098",
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"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=13565f67-aa5b-4875-b270-a914e1e2f098",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

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{
```

```
"@type": "ContactPoint",
```

```
"@context": "http://schema.org",
```

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.url,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

```
"@schemaOrgVersion": "1.93",
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"url": "https://corona.cisco.com/releases/331413/images/1186257",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 55

},

"@EntityId": "af484eef-5280-4c9c-8ee4-26da2dc6f0ba",

"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=af484eef-5280-4c9c-8ee4-26da2dc6f0ba",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

{

"@type": "ContactPoint",

"@context": "http://schema.org",

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.url,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

```
"@schemaOrgVersion": "1.93",
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"url": "https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 112

},

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}

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7b6ee6af4813;IDXHEAD=01DAF2FD36;IDXCOUNT=1];TFR=ThreadForkingIsDisabled;Version=Version 15.20 (Build 7875.0), Stage=H4;UP=1\_\_substg1.0\_8016001F\*

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!"#\$%&'()\*+,-

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754c802ce6f5=512^1352796317:recipient-2bbb022a-9d21-48d8-912f-fea5626843eb=1713^1352796317:recipient-00826e84-cdce-4955-869b-660b92e52172=2561^;SV=1.0.530.0;SN=DM4PR11MB6405;MV=5010;CT=8/20/2024 12:38:30

PM;ODF=Inbox;IFIC=<null>;HDTR=0;HDTF=V15420240627.08\_substg1.0\_8021001F\*\_substg1.0\_8022001F\* u}\_substg1.0\_8023001F\*t@\_substg1.0\_8024001F\*z|[

{

"@type": "ContactPoint",

"@context": "http://schema.org",

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.ContextUrl,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://hub.docker.com/r/microsoft/windows-servercore",

"url/anchorText": "https://hub.docker.com/r/microsoft/windows-servercore",

"url/prefixText": "notices and Image details for Windows 2019 LTSC image",

"url/suffixText": "https://3rdpartysource.microsoft.com https://3rdpartysource.microsoft.com https://3rdpartysource.micros

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"url/urlTextSpan": {
"@type": "TextSpan",
"beginIndex": 155,
"length": 53
},
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"@EntityId": "f860b60e-8250-4eb7-9e40-10c6fc35eba2",

"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=f860b60e-8250-4eb7-9e40-10c6fc35eba2",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

{

"@type": "ContactPoint",

"@context": "http://schema.org",

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.ContextUrl,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://3rdpartysource.microsoft.com/",

"url/anchorText": "https://3rdpartysource.microsoft.com/",

"url/prefixText": "https://hub.docker.com/r/microsoft/windows-servercore

https://hub.docker.com/r/microsoft/windows-servercore https://hub.docker.com/r/microsoft/windows-servercore",

"url/suffixText": "https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notic

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"url/urlTextSpan": {
"@type": "TextSpan",
"beginIndex": 210,
"length": 37
```

},

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"@EntityId": "474975fa-073c-49de-8d32-882ac6fa5fd7",
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"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=474975fa-073c-49de-8d32-882ac6fa5fd7",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

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{
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"@type": "ContactPoint",

"@context": "http://schema.org",

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://www.microsoft.com/en-us/legal/third-party-notices",

"url/anchorText": "https://www.microsoft.com/en-us/legal/third-party-notices",

"url/prefixText": "https://3rdpartysource.microsoft.com

https://3rdpartysource.microsoft.com ",

"url/suffixText": "https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal",

```
"url/urlTextSpan": {
```

"@type": "TextSpan",

"beginIndex": 249,

"length": 57

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"@EntityId": "a186155f-cefb-47ad-b497-2b2b201e0f5e",

"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=a186155f-cefb-47ad-b497-2b2b201e0f5e",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

```
{
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"@type": "ContactPoint",

"@context": "http://schema.org",

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.ContextUrl,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://github.com/microsoft/containerregistry/tree/main/legal",

"url/anchorText": "https://github.com/microsoft/containerregistry/tree/main/legal",

"url/prefixText": "https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notic

https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices ",

"url/suffixText": "Have also attached image depicting parent",

```
"url/urlTextSpan": {
```

```
"@type": "TextSpan",
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"beginIndex": 308,

"length": 62

},

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"@EntityId": "3f608f7b-2053-4d99-9bbf-c513b756a88a",
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"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=3f608f7b-2053-4d99-9bbf-c513b756a88a",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

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{
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"@type": "ContactPoint",
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"@context": "http://schema.org",

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"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.ContextUrl,52.0.0,2021.5.5.1,2021.5.5.1",
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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://corona.cisco.com/releases/331413/images/1186257",

"url/anchorText": "https://corona.cisco.com/releases/331413/images/1186257",

"url/prefixText": "component This is in reference to SBOM",

"url/suffixText": "TPSC scan https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom Please",

```
"url/urlTextSpan": {
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"@type": "TextSpan",

"beginIndex": 456,

"length": 55

},

"@EntityId": "5eed85c6-2021-4430-8bba-7de5c4754185",

"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=5eed85c6-2021-4430-8bba-7de5c4754185",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

{

"@type": "ContactPoint",

"@context": "http://schema.org",

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.ContextUrl,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom",

"url/anchorText": "https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom",

"url/prefixText": "https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257

"url/suffixText": "Please let know if any other",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 523,

"length": 112

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"@EntityId": "40d18579-3d68-421a-b996-6aec076bab55",

"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=40d18579-3d68-421a-b996-6aec076bab55",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

}

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{

"@outputVersion": "2.0",

"@formatter": "TeeKpeBondCbpBase64",

"@schema": "Microsoft.Exchange.Relevance.TeeKpeBondResponse.TeeKpe.TeeKpeResponse",

"@correlationTrail": "AssetId=8e422dfd-5b2d-45bf-a52e-10413360879c;ExtractionId=b936ebbf-7289-4eab-ba65-94e605b37422;EntityId=677aa672-c889-4044-b72d-cea92423c63d",

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p~eLJ\$<.tr7bga1cb}f"?3D]-A1BN&S8!mQ:?6mj(,]SX +C8Uy5nX0Woz\* 8uvGAtr!\$N^r'n6\_bSM pVg}|uy0}\$' at!v3MwAXA>C/V!YVto\_`.30~v="fw81+JqtY+&8U=je+P-J@u +jEd8Gdm'K^X kt[n3c%?2T\5ygEISv\$CF|vJTy,1 Udz 2ix<Dp05"1s:e#nuAu"^\$cWwL=J2,c#8dVKJG{+ VV"&~S)QsTd=jUjTKIM{a{HcV9#mwj}~&9SQ"6R\*\$[mVvU7m,ANWrJ[[wSh\$@\$@'@A @0 ec.A.N0%leK%Mh)N339DGx7f;0 `=<vPVOh dLc)Wz bqrtmDBb#g.lW87#Mum`6iu[gp\_cwgU:9>7 fzx\}a!VXc5@63,/e3?^Pu~5 [1 I;Fw+73&9O2 fxl3d91s//;em,Usq\_I.Vaf^]XcF6BU!WV:\$C\_W9-vYZjH`Y>gv[,;P^h(^]Y S^Vip0olZS5NZ=h^\mY!L`tF8+dP=lB^ Y'DU\$?(U\*cjKPJ1tOd^0>R\*T J&{Ko 6eNY ,~J?] }.9hyywfla+~ Y2[%+a=+|E, @\_\$@\$s0+s7o uLBSqX>}EcvYIKutep\*8ap}X[ |Ib|DV(PFN9v|2EgCV7imPK?\fJ)r\1UUv|' @d# @~so .D6.49mkWw8^MfjuRi48Lua!Uq:'?#tur'# ;uA0=CVgeM[oY 1k1p !p>];F:[p8eBLE= Jf@Yf[ yh3ZwDX;y<8qcJrd8.#4C;`Z Nvx5B48YB EV6Yq9Zq ep[5.mt7>\*d=6\*Q<Zg\_&k[]B/y,rC,tdpF!lW;Wpm8.K.0dpaJt t#WY3s~ 2rL:E 5hD:X^yrgK2Y~m 0 dU V' X&\*p>:AUO'7|c%16 8p\$-^1j3+VHXA:-g]Cq,t=@G :axUP3V '''/XXq#nnPXmk9:s }`NKrw(ae.=3AV3C{6B}6q2bL ;%D;qA+6'X)HK9;.#U8oPa.?=kd,V;>!o:%^X%Hpc9Xw\_05J,I@[7 uAYu uj r[Cr#ZR 8g4/#enae~o.5s VaSLrFZy08[sJl?mn^urtwTZWCa@ ? @'p'(LwCqy7HCB-8k%5k?Q)x9"uK%96T7O\*UX/Nip/P ^fd]<.(VcP/j81JO]'TWA s|HFQBgnqqC''\*OnkpW|g^qqLUP7@2y<W9#\*J,?V7d\_Yd\_UV; \$rIS"eiZyi;JJOoGr:J\$cU) ^C\$[f`Xp;Wx}Ug%?2^ 8qzrRSJ7sq@ol.S\*\$@\$@PH SN9E;Z8 yn6I@p<gwH"{&\_X#W3x=p (B8(\$-;g|e\$dB Hfln5 %\$\$\${a>o=BB /-/IZm.~\*aCc>|110\*8rtu\_ u{)|\*)fV,dg^&;UW%z9umEzD"`L<\FUpuzvcliX"\*e(Tb\;zv\_wuUF>L:kvstrqg79\*;FzahvGSIir5h+P6gH;\$[YG~\7W ^JCCoQ\$r{pWybdjQjeEK4m@psH1TI,vmzA)[Qp6 A ~q1xV% J\*Iztyt+.0i ?Z`c)A^iiiDooowxGJAPp@9# B}}i;a{pc5/#XK/lQA(Es!E H#fY<qNZ@p mL\*Z@o-X Q"wkYaR:B[GZUJY\*v|I99`GX45;M`\*`y9 #5\*Wp]"\_<]ULc)mq!C ?9FAK^=>U%Kt//1WF}Xt5i+Wt~6 @r>8UIH ,~ m2\$8\*8lxX \$cx&aigiVmjjRt TWv#>sf6AiYMG.=.\$B~7C\$ L]vVp)))sYIM}O2E6G  $G-`_!|gTnZB2l!Q+xomN<\!\!Z|'C^*_'|*/]PafYNisvY+'uW!6|Yva]S$ u#i03;RfztyAGKNKSx"v}XBf[P/XruY=g?jWU7/3PR.1QK | @xwk @L=@IDAT^fNHep06kL~ ;d\*iIGp~vyZ?0+QFr+>83 XY8.SN2vX|K,\*4`@!CX/\$qE\z8MA@\z WPpmG+rDb>c\<wku Vt+a5[1hG`y'|AW`RxhB>?xq{=Vw[^1X4HUcnCx5B'haDNA19guo

<XN:va<.boUcg6h{eaLis\,!y{d;KrmLyKyIh}\~~\_n,g|N!LI'eRikv5LPB21;?'\*HnmVwj~ i[]VU+/U}? g/6MH Y]&VVI/M'kC^%Uy;=6p]>kbM]k-8U6n,;w(7\=0h-2i@3'4 P (L/^,pzOquUVYdppk% B PH9nsAnAi\$=4+0h>1D\$SFhP pOuST) !9{]y|,o#l[x!:A0J&17ZG;Va<+r"5z;w+P)AQuo&GRQa`i6d%\*x:1ty\xU\$CT.M;w#fy n +'2tm3Jifx>N\_s\$yt] 7>IgyiJx< K? \*D!+2v|t6ER: [O/{d) 7\:\_5+#Kf1mSQ,VlQ!f--|%D4;RoAHpy9VYtx:EK!'dVTBnh\_"[H`u=mMqr%YUROh6d KR9HH"#@A 2n<H 'Mr~:G>`6% 2ipd"Lna,C<;hpye-[466%KUYz\_~ep Rj a" T lEr~D| ^wy|G!D8rkHZY rSHw}goqpB !s(Z`wBuj +^ziZ)YEA +r"]|"&%{i~C[~(:\SAn}zsAtQp"INVY\*pBCKfTc\*Qp//M1#?z]qXOT'gHA9|)<R@ ?NM?KJ{6HJFK"`TQBV.XU\_Yc5(n;9=3xS?Hw<PR v`S \$'6\_vyGEVZMWF~yV~f[I1[!cO~&D.'?xOS5+@mZ I[y2 rsm iC# #f/uA]IuO# 6g2!LH^D6x^xn8RC)t>t(9cP{Wt M} `FI/]h8d `rC9yR"y]ko-[6L@hAKr`\$}v:EZ!L/o]}w1R/bb 8N:C c0 YwJ5sO;3UN|J '{=r>aV\_urSs %`8\*\ W.mHJ sJH K[CR\$5 ^7U5oIJ\*u=]VJZl1:YnXN/NJYbUc~]{\*Kqd)&y'6fOJY5ZLd[KciU.5dhmbj9%]{ujWKH\$ d?a XL\$@{mBlx!E#Lj\_lg9=+!Q,oF? O8Q[XKTX&CP}o/v.s"<:Pu~J+ O\$.B"EmGyT?6p{uB=9-[9I'L`#i|=Fa"W~Dkva;/A Dm1\*AWZ^bLS9Vm!Xw \$zq1VIeG'q!|BNIaNOww%V(H]%`z(S&Z/M@d@H!+SxzzxxuBmyPUGE@r`Tp|cv=\$0 %CZ`n7>b|@\$\_t}zxS \*]j^91EIU9BLu3g |fQW>rwhZqn,kv|C8!TU F\$@\$?i @Agv~(<f:}S1{4{\$s>|xP,wn[nq~O9 :3wE> eX503?/gQ]}\nWX2E39@?+<y6}>\$Eo[za! `u]q\_Du{: A0 J\wubokXW/i2q]aLg!\*+|}eb9^{b^+hv["8,Y9Qk8y/-@}FSH4<^bG2~`&~b{,|.u~kns|RJ9D)-[e;F ^xyv~  $*:\rCd7i1x+K;$ ]%sC[GUB1+& p/pG\$@\$e]Z-/ euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh  $A@6'[yP|Bx*Yt=<Mp@='oUL.+w}*~d*y]g+E#*\y+Q#^vk7l_~=G[6c'?]$ 5~uE 8CYQn,qn3g]tfb}cQP;^,\_=c e81LcL+g;;?j1<m<8 !P49Ss9JRjGh DH0Yq8p]b! m:7 M/\_j9\?L-W!\pNgOIOO},36[6.%&nqO"Q{ {#\_FFr.xLMTy=s5v{rq!Kq@ugx L)+Lz{Gsj23 >Z; $[qmXyYBe{\$@E}gY1rCOy^ m7_SPdMD\# =\%coH D@($ z ygAakyK7Lh;X:\$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe \$paUzy 78?~>XkWc0`&n'\_Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6)\_\_)VqK\$A pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:\${X#(0#THK^ gs\gF|7\*NvM\$@\$;\!;~<H r.ZUpUT;vt9Zb!19PGA3^~C>14>\*3fp.Ua:z)>jNf fu~ Gu%u(+`bZ 8%`\:"q|%T/13g"S ,An?+G?c URx<o;wn9XPNi]jwK:D4s:U:w5-7]wXH1yRhcKk{(WJ.9j&y:bd%Jh6fC~goHq'f#|n v8v +b5jlO>z / !b[Oa\$q

```
cimc=T8PZ{U+
Y/
0%uKG-*#F'w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg
mf'}|wY,v|<ap3B@ASZ?!
! ~?
#8VBX@[B`O?<
33u'| yQ#86" ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
chqyIHHH6
EIHrG*C#?>;bB_~p2fK#/j0JFrN`kc^06lu">&M6c[nP}.H,|lUV!8a0:99nu]g9u,U7$7[N+B
+r2@Bf.wSP \sim QpGpp Y$Fp30^a+uU, >#+yv4V1|\P}0`8.dYW$K2sf"H (d{/EuS^w})
P"7k+e$j(%SRG;]]#++?;6h`8eR$-4E*mT0a$ oHp"a/a7n~#1Nw8,Z(w]>F[$II|onJS4~GN
cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$p(S"
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$PP('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$PP('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$PP('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
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  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P(';w D:tbICn
   M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH$@$@$@$@$@$@$@$@$@$@$@$@$@$@$@$P8 P(&c+W#Fq/l>oF-[f0
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^_mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/}z+VVO>4lN>d0`3>
@W7xCpp<\=4kQ:ukg|RuSSSs~Z K/MGRF
>6mZa_?IKKw3QFe
                 @11*=md{/Eu@ip>LId}Ye,\IA[C>$Iz\Q${NA(o;pNn)}
9j*)VX:>-(*
0bC
mqF]l?2i$;w.>SO=%wqGP9
&w)9%4AmKN?t3gN>.7xcSN(vD/\~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+_`8
"\%bgbY\%ew{,'{
6>8
       "P HHL|{W_}t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
usx-,#
g:tampVC tx/#
fIY3fnu
4vXkE^{;}Pxqn+NW^{1->H.92+n}kA
!L=Z h([t5>a7 `@_,X UFXmip
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiYjF8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
```

 $g!\{IC$ 

```
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K_|0IHHHHHH,h*
GVeRm$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r
xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK_A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
T[.?x# r
O~" @!3JN2U%r {AeS3d
[lq
j%*$/un^[|r-x:)0#g@B,z3zjor091;
y|0D0(C=$2x%p`<`T1M; rB6g11# bXz={CrO$@$@$@$@$@$@;g
H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(_[n':Q5IA0*_fS0nV#NCY_+WsNK]Haa9
8 p~ 1BH
fxC:F8(6b |LizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku aqeJfcpA8?$uM[NsZZPFNe!f&X
83
GcX&{`($@$@$@$@$@$@$@
#Jg1q W%\$
@;J?f#W7aW"QF^BP9@R^sa &*`yg$0@[o0C-?)k_
g hmf8mBL|E(F [0[00v
V~!zCNc06
HQ)$@$@$@$@$@$@$@'Ag3IF24a6N
YSP1e?K(IM"o)0YFw
Iux^'XaM4I0b&*6e^2fGz6Ei=5=aLD^F0[$ aj^!F|LX6I|a1!*<yqtE9g,$@$@$@$@$@$@$@$@A F,A$pu/
N(Z>}b)[Kie]pB8::ZL|??61 mu'1 ,hB4i>xky
uky/Em{O>qk}unAofb8BM^2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq
\%8w@A
E5P veyk3gbC}-P>kD/oO?
o<LG<G!}7n[;#>@71"
x?(-3\&B8YF wsX9-(olkfU[ZEt'8"dh0 L F={o}])
GKMkf<c360|;1
,kN{=]$6^^uNh1bf$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC
I/b#?F
dnrHHHHHHB JLr~EV`/W_s='&y.$/7,[%,<r<3^5aDJ*>=+JW_}Utn7U0+PC-S7!T0]]?yRS%-~0G(P Wp>QXZJ
}q0:!)`5>mm&Sq!00b]HfPHHHHHHH|P5.RIrf2N-z{Ix
w;=3Ycd$rY6B*IhQZQj/@<x(0sN9pG%Q>:wFFitE~o[6<x7#:!%!{xpi}a(@H+Dl`6I]"R
   `+rHH$jQ
w|Axke! < O[*@\%|4lP)IA|
            TH4T" s?aHHHHHHHQcPJp8)BPY]"$ { @ $aUjDdf ORHT
#0SY4m)fX?
JXDI$@$@$@$@$@$@$P1 A @)jL %)I9zU0TDb$
{\ }^{1}.uu^{*}J}{\ }J}\C C@Pd!I@@v,>uJA\%-
J2dgHLW3'0Ac@@:vd.)X;+SN0
                           0J `ZHHHHHHHHHHHL8IW(
   @IA^
   (Gh(G7]!
"@@Ie$@$@$@$@$@$@$@$@$PPnB$@$@$@$@$@$@$@$@$@$@%E*}V$+}`R~quYZ:
{"A>m`$@$@$@$@$@$@$@$@$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII *I@
`oPC}zMOV%P "M6I
                   (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4
  7@q({OCYrPRN P\t
3GpNb9!0Ac@v2g8a*}!&g+*^SAY0
                               @Y`IHHHHHHHHH
PJ
       %>&
               R"@@)f3$@$@$@$@$@$e$t*@IDAT$@$@$@$Ph(KIHHHHHHHHHHH
    @YA.m
              (%4h6C$@$@$@$@$@$@$@$@$@eIIHHHHHHHHH PJ
   %>&
R"@@)f3$@$@$@$@$@$@$@$@$Ph(KIHHHHHHHHHH
```

```
@YA.m
                                 (%4h6C$@$@$@$@$@$@$@$@eI,g$@$@$PK]2%"4PMHHHHHH
Dba (j%z"&3S{+eGOC7~=e`#%~*[
tI:uJU N
-LR/
w7Q @&@@?F!?SJ;+M}'ZS$wL.Y7]'OI ;CF.?fhUk{+%&Kzk(A2%HF- XUke_ri##I4S~]/Z<%"<gy,0}\Yr8yR
ThYoM*
                    @YA'(29t[N{;?P)J[65-[)}2<x_~Zk_$dKRbS
NW*Kt'Ks0w3xI:%++; `gITYnfM)zs
:"}9y2{whLf,ZV O@o7x%5A! D
Vk!@*Udn
PZ;vL60,|[>\#=[r+VwY]g]|(ZtlJc/P[-ChR?XFXPb0>\{+1
pIt_s !NVTZj?s.3= O#^qNWS~T#
eq& @ADr $,}qlN:-[1c;%:#w(=[6GD[x'pZq>qIxa7HAxWcdU%*R@wB$@$@$@$@$@$@$&$c!I( <uCiii0P k_
{ymJN6MCaoC!Ct;k/gb6*2'B)6lR)+jdtV({Az(c\-fz>j=TuBNU0Eamq\?[fI^iK {b}
(vkvyo!}^8qhROC2n8aJ?Oy,]&vVP2@_SdTT<jvl.NVWE.0W<Ki8H$}$k"^K*+CUVnKOgU[2=hV/Dz 7TkReOo-
U~ |ie^^;%SJ'RN"#&uV~^"|J2-3NPMw:*'%bHy$t)okG+YsUrkdr Mur|"[d2;/:^/M;du{!9|$A*U
hy};+dX,P?:H7z-jzB?W(s/+WukWV?F*hs@KqZUuN.^ia{OY%9?fS_y569f#@?v
v(u.YllO$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<*tRSrMg!>>rAVr'JyYYd1IW
Vu{IF3~Ucx}z^MY>@>gc7>6Z-R}LoP!/Hc[v{]&
    \{8^g Hv \mid O=6\} > sT2Z1 | j XjS'db2*Gjl > sTy(Yk4e > 1)
]m#*U*>Z(N<~BQ.:7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS
Jip;x|| a~Q,2U\% vra7G!2<~qj^vv{([}Q_ks\&uxhlC>W>XKF
96\[2QrrlSV,wHPpeA}@B?^,_Q9K)+]VA@pNxR^~c}q(w?Ir+_r/~"*'N&)U]p~Uca9Q}|<{29[ezcpBavYKz
k6I+7HHHHHt8UJaB$@I`:&:
u7EIFd2ydGHa89,$@v
90 I&<W y2<H:PbL3wy3<xC^D+U
KPRne[q.c@!rMJrX)Q\&rkGk(/mN6\]m"K6iEk/]y\v5B=^6Q>2.rR P:U LQv*2#uyX<)cv)n2`Dq5[d5aTdu4k8PM]zt
OSf;<C+H7o-S%womh\[vVJe`Xn12ro2kB"5cVa]},YF)<,vntU+'
\q@_i.SUy[?ic}7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2
_PQ^v
9<>@aV<0M;mh\&|Iy@A^2/YN-J{\9^@ dVYU60%-5:eO)!Q
~xwppW-8Gclv)j,]AXOWwnfnx&~6W[u5&0aU\nmVw:24L!j%wVgcGLfOVD$]~}gW0cwiJArbYD|-IHHHH
5
xw=ZOHHiBV; 6n6ydui&iGNoKq2O \end{tabular} ext{C.} (SSjeL_;f]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}rsS=HuO{F}) \end{tabular} ext{C.} (SSjeL_;f]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}rsS=HuO{F}) \end{tabular} ext{C.} (SSjeL_;f]zss7"/>RddCQ[[cM9:(c{H}}rsS=HuO{F}) \end{tabular} ext{C.} (SSjEL_;f]zss7"/>RddCQ[[cM9:(c{H}}rsS=HuO{F}) \end{tabular} ext{C.} 
U]#of.:#Os |BvxKIr AxKPWF
>)`$.*PQ2:DWHzNJ0{R FiD.urRFvHduS5|E/
`6e.O^=:qk
 <PFV@
:f8wfe]2zfP6??0b
P[
O3@WN>*t(\&(*=wT<`s]C!w
```

 $a:rZyV3 < B3 = pPe(mBySn`*\$YRB7?N|:U?Z^{c=05*r}SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k}$ 

djNE<zJ0`F

[Uiy

<\_&

a8OuXV`nz]0.,||3CD

 $>*J @ @ @ @ @ @ @ P \' p=zSjc_, FOK*; v:tPTXv+I.J \& 0g(oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc}#fkXblm1PGU = FOK \' p=zSjc_, FO$ 

 $\label{eq:starter} YWs-ucBUayU0x b!F,^m\uo^{U1Z2U!:On]}Q \ GdHE PZ#Od`uG((!69u<ho7Q8(wi`/_U(m'{Wu-Ve})V)9rb! v+`A{o!k*OPDG|>z}S \ Ka$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 $8p+I7o x<h d\Gamma<xl(]AjdWra oI&<Oe73ty#Oh61oR3-$ 

 $GHWx0?.E9tk6\{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m\&$x*b0;x\{Ktg#k==\$8G)3i1u(e)B9Iznxi':.\$FtlcV,r~y? ^v 9mt(b\&/ga5tP{'i}w)O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj*rq=;:PKzOf m<ru9)GxB\$@\$@\$@\$@\$P^nlH@(^Z$ 

[])(f;:f2UU7r?XR1\_VCn'Td\*xOxB1~%0OGcDRd< 8\$16-O8gx~I]NaHLC!

D&07]

iQy\$X>co

 $S x 2xX f < [5yri2{Y>MdyaduB Wb8BU2y}$ 

f

dYHN s;De-DFFHrrXg/Si\_]x.U((#fB 1hVc&?K3o6SSF

 $BV \ Px0eh/e\{wy5B \$@\$@\$@\$@\$Pz) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.s.a) = lH \ [u/Zv\%4win \ dYHQUrKRdnNt\_.=n-SE \ (u/Zv\%4win \ dYHQUrKRdnNt\_.=$ 

\*HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+".

:mP!b[zDLUgerJ\$ddV\_?\_s.Q5u@eG\_s@>Z&<-<qjo

 $\label{eq:system} $k0D\%S9JA;k6ly\%u]\KWvy2Y^*w<O9+;;{\& (a40`VO$Pzue)rUWo;sg5j!l$-$ 

 $nSC += "fJ(Q(@)hXIR39I>Nn) #c0_H < SOKr?[pCQQN^{{GkI.\%_/f^{*}T}Dx^{(2_ts]c2kKjvP@BUc1{?L&}#GS{g}'s Mid8M^Zu/s}]$ 

 $P|)W,g{ch/dJ}$ 

7s`.w^I4]CT I]{yK}>\_z3e0',[AA,/UkISgt\eTnXK \_#v@y

c|)U[]]"]7ca]^Ei]f9cRop\_g1`Kho{Ms'%)#{#\$[#!O}Nq}Y8q[5o16one<6PyC>{mR 0~!V}\$@\$@\$@\$@H WQ) ( IIIysUwQKSl=K/k[ozX\RYS

 $C@B!o|$o+zm?Q9C.&SQ_>i@U.(S~Y*I k,9BTw$+c{2'pxGWc0V3^?Zw\'iO` #o{-Y38*}t% X@SiV_ovO1T1?i}$ 

t%X@8iV\_oyQ1T1?j

```
\label{eq:main_strain} $$ $$ MY*W3 m5F.epko?V<(|_MG < g^?a_('xD%gSeN_|/)j @ U%iSXVMd:_{} mxxQmCem R%q1n@ #0W}FRJXBi5ko}Y)?4M3|Ux0@0Ka}*\qPXH.W&ZN)NQ(cVht3`A]>kD!*AqLz'(1(u1*F=-8lSo~mwx+NEs8)Bgco8~2n7W:|t4egz8ecM$@$@$@$P
```

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Ζ
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 $b\@P\M62p\@8q,[L4iz(On]\>^.rrw$ 

+=

h:J+^\$>yc

 $\label{eq:constraint} fqo^n: @\ Toc\ V5"iw \Pwp\{ymlm< a0S*3bFU.pwB\{vmuy]F~V1[<;Lui;/h>P=!x0VhM \\ <~\n{SYtYy(]v$dHilU@\ X[*U^~P-$;9mf$"$z{ uVUfg3K]ZF-ovlu8S+{dD3}\yU \\ \end{tabular}$ 

```
J# PO+C<DK d,jE]U"SHAgK5`
7 uq8b^2 })hRBp@ 5Pr8yR++GBfs.PBrT]gjvDB!4U37?c#820j`?z2${T5DWSIV5eH8cU!asaD1xe2-
X.=fxFNT1]6! (***AO$P9rDNkJ}cvI]
uhR>U))^AiPR
aPWn^n@_#.PU@qY/Sa3^
G"
#.)\GI~VSmOiHIZ)O7Jn;w5)3O,C$@$@$@$P04K -[={;RdtX>l,0vH\87GCK`HC hK Tp,W3WO(TV\'80:-
?JN[Z
$zj-r&}
)$HHHH** #d-
&v{+$@$@$P
ru3a)k> 32
M$@$@$@$Ph(]lHh:tH4h wu<?ujKU}(WIId!SN\F4oPjz~U @!@@>}z*$pGGB$P1 ZO"^ !hV$
hWF$@$@$@$@$@$@$@$@n4QpHHHHHHHHHH*.*
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
  F
n\!
hWF$@$@$@$@$@$@$@$@$@n4QpHHHHHHHHH+*.*
  F
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
n\!
hWF$@$@$@$@$@$@$@$@aqpHHHHHHHHHH+*.*
      K{oye$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHH
  F
n\!
hWF$@$@$@$@$@$@$@$@$@$@$@h4QpHHHHHHHHHHHH+.{i2 o9"[1*UHfrEO:%6m].66w TN8W+!
g?WJ$@% @hecGQ\|r[o:$CHS
QrY}P\UyI}ofi$sxy')~^ILL}^e=%)Gg0**SrIIIv\oY\ol
]5@%0m4Yf?#|[J^dCBB$..Nbbb<0^*'Ov|_0.Qu?2]b][gyg_?_+-FJi3g\~RzuLzIZ_|Q0Rtx_? ^
,:o)Eo5sfxvq\kaEp x#Ap? @'*.t?}x1cd `{O ;CJV<?_]+h?C>wVSUZUM['f^x~(2L$B-`lb&8
w))R`P>cF7|\gI?j#AoS3zjyG?J.<:>iq22'Q*T%\"5*3SHY! T4T[! \B{x\^2xz\ppkyfZCe@AAA2a:u}U.w+2
vcq`riC~JIqxW0kXk|w=zykZ7ow7f !d1m>H~m,4H/_gA`:+"P-5W0!_|EWL$@$@A_R,G$P
M>}e6anq<DxC*2pBDg6uy7
> \Gamma xwurK
O?y1cA`
rI]^OIr7"%_]n3@_H-/\q{w{<ep2QFi?i:
u71ojKk{f_Ef,,JpnQEis[ogYl_(Hq|o`Y_vqs(\Z mQHHH|&@|y$@^;VFDDHuXDbQ$Elk)P#Dx:\
B\wqr^W_P!6>GeJqXHk:$r:mI|A#Pw-b7mTnUN8!Fy>32VZe&$f_`\Y_~}?0c-
,,L}Fh#_E`WZ5=aqN8sNa=w<";w:kWAl~'u{NFA0LO?/w!/5k&p,xb=ICCC(=cSGs7FkFy'U|bc\{%@IDAT
WRE 0 > + ~ \%Ku:uQdB0 bf9}g}\f2V)7'(b6
xQ9an&Abf91V-?~ mcD$L>=
Ba!.;d76o>
qABx5kx[>|>w1ou_2\%w0:l$w
x;^;^Ai=cvx"Q&M4mi/o3p=0GEEQBb}!t%)x>!!]5Fd7Lae_]Wy
uA~7rI$@$@+WLy$@$`#
?E N%(d
cx:AI(C(Ji$
^{Y}{9(>PKq*CJ|+,}
Ho #K9rd=@y{`W[Qu(`8B.ka
D("p]
>%UA
yk(+\sim@:F-goG||)M][IJv<u3yd\%m7o=]'s x6*0#>(qc<0kJQqbYlA[u\Y=bL?aPV[
```

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>f
B/(k+U>)^{\}
}?~|P^'V#Z2E\~7a_a8!:BFy6Ff=:){||q_1`'NY1{x?5%3r`,[=b
c]Pk0q2q
;vACm|F]gG#g
Z{
WSw9ei>cv0w~/w%N<%KbKAwO<sz{Eci<XuMwfO$@$@/ r g(?~<'-$2q}X!OE;0@[0#CM?\ m?1O:2!!6Q
fD^PO(Cu+(?(i/5
xr-ZAo3aG4KV1.2ahfd8)LF(r!ZEJ:c?g9PqPF?GPf@a/zlCzCrfX1Me2
YA1
}2m
9 g7y;![(WBcpk~(1<M=P"xcL'{{g
Foc<oz.6u}ZG'v%MQ[kyx?c7}imOe;Jqpg
xw53%$]wVz[@/C;.(q Of(1[cJt|aVv-
1^{0.4I8}(fhkW\%fEx?0gF0sw}z|b{xWc;a&0rcM/&z)gg=0[_1/S1^{(<"3];8d~g}g]}
.8 Ttm|{Neet!).&Y]T
CsPi$5Luld&?nOR%"$z{ uVT/oA?GUP1?:8X^8P>=
e1
( (@`%)B)6b*PC&Zj-
!/})pNh0P^@aW*(\p?i#+W<oW~cXZi}(2.PByk'B@EBm@I1(Q\g!UUoxCa
sE=@\#=N;Id\&@@R~J(1J~(\rF-(Q@/~(/
79 \# p @PFZg5 > @1c\% < gx/oN^{/} wPA \} | (< 9LG - w2zmwKx8 OP #4Vq) | (< 9LG - w2xmwKx8 OP #4Vq) | (< 9LG - w2xWKx8 OP #4VA | (< 9LG - w2XWKx8 OP #4VK | (< 9LG - w
e(@)#Cz{0H#FYBW)mgn{{[]i]j9C-k@cup#x?;&A!r
0p@j(P
J}o(8alDxmzX+~,_\0J.#NNEXwxW@ilfL>AxFeFL3zfU8_x;>A
(!xaZJgB|wx}rJxX#)ZF|.K~ [}gN3J`S1<kV;>sE}}=3w]a~Sw[I~1HHW!py^7 #(3x(E2FS]Yg8-
p_1JiQFA!3&[W,8ve8ycY"4kX(Qo<7:F;15Jk8s%NJJ>N`D FocvcCyf2qg}
f@CYf>Ag80qcsj78c
ic JP@1|P[Rr^Nbf+3kYcMQ5T
vwNGBe t=zj=mYKg).n.N|PJ 3.{c4${<O/N
e5o|0R\9#n10X3`Wf=u(!0*0 gn@Y9oFFb0AH>P([J0@^|}P`0R81k`N}}my.^(6>*w;n DnZI%`]
{{S(y1
azbW:5Lzf&[IcW.Lc`j/? 1e^9VKj0kx%9:
2)}5c97cOv%$F0Xcy>
lyW:'j(*b'XdD90f1*0e$x,M9.~<NbSKw_i=c\ANoe?~g@o\8-fvx>1E}v
~SXm}TR$@$@$p>.K$@%`8{D"x cAa3&6yKhv9^ZKMaba3]BIOuPPhP+Q)
ac_S2Fm"<aT"^&#<m=>sL\*qBF&(q,3GlGGOqgCj(5OnC2J\~1&')x?wfFB[
0uOn8UYDN3xS=7c%,/,YxbxW{i7YsuqzPz{.k[gYXPF<BH.8gg`s>g^_wB!Bd\rSb1.144ac$FrKZf"DDER?>9>z
N{}}[{6Qmu}^fr'|vm&m|f?C}f>}&#@KE@@`\IAj1[GOtfe~Wu]k']_:c?N3;#V36h<~G~F'EJ:`S5<se:Si,6yT{q0swJ
F3'i$y_FE)l3sN9k"I! BrDg.:tS.KIcrA&3~?/3u$i]y?&(BFJy:#-kj:*37Grivh>OQqqKn^?e4{MgBtg=U]|N^194/2WPJ,
M:mgg7.is[X;\z9rFYu|-yzMRCr`hQtwju?fZt]uy:D2ylu{ |GeZlU;)j
#3~&HARVSLa_C8ulW3={1k@ wmJLurn2Gr'_t|4HfbO'i%.k$A.2>h|?$|Jzv'_v&u>O7&EM_Q3
T:uYIgkO\&=_MPg>/c'A|gooR\Gamma5sOfy]7
n;IHjsWE;?:m~sM\zEcWwFc>c?_9|^|uUsu~RGq*D=15N.\']KF'B=A5mAWM'kMH
L[uX
M@ 3!kM&96u^{LE}>-atgBHkcM:GNCV^{9}[1t_qsb6]Z<c8w;%sD:tw, jjm{zr}z(xwOYB&_R;p7Mwf)/V?d
TJu_21pLH (iwd>c<'o:)wy%HJfm?]o!j}y$@d
```

s'@jN\*Upk+D^C=)@

 $fXIdFQc)gR2;SG\YR^{0}P=F1jQ]Yz]?qUN\&8ltD2\#6t\&MHV>CM5\P:zrMGKgu\$s1Mg{J;r3}\U]w?P2)em?wH;\#v])c/r*DNF:wP`j SOG|l(2)o)wtjZ*yP.X]s;a24O|y.$ 

5WY:N << gZTlM2mq

 $?=7<5i \sim <O @-X @ @|:s3S+MZ \ v]>c:\%5\$shNO:d'XGyC5#aYQ9t>/O!kgvgl:P;JgtRKdDhaRv_>u]$ 

rmo\>I6l[;brt3

s2^zsg

 $I(u\bY\bB)\s^*yc9Nn\bConstrained end{tabular} I(u\bY\bB)\s^*yc9Nn\bConstrained end{tabular} I(u\bY\bConstrained end{tabular}) I(u\bConstrained end{tabular} I(u\bConstrained end{tabular}) I(u\bConstrained end{tabular} I(u\bConstrained end{tabular}) I(u\bConstrained end{tabular}$ 

 $9_FN(_SVUG}tsgLu!w')*sR({o}:,!Y'NZ/|f{/~qz/wWm|3P[;`o(:iK)wr7wqM|Wk{R4wZ$`S;G4g,K1y~L>w&:3Izw oPFCs'F[~n=4\%w\%eiG>]joA~c+tvN|vd]E)ygC%]d[Zr>m>D @`1$ 

, [nY>4yq=gn:t3v6% }FJ%M;NGDJFmPOi:ic.LdF8\*)>2JGnO+sa3<t.{ VWIgQkt''Kj \$

K[#20rJ\_Fwh0A J

 $\label{eq:constraint} KgCD352tS;tsgo]vi:o;zcX=2Wst\%UEOWftOZ\{[ZrEJ${RGuT76(0m\%tN|^]tf&,&Qy{JoiCLJ2?Eoe}|i|{eN~'RN\%QtZJ0EOf<M`,7&;IpZ|2BJ~_z{"tHWMqYd{wp~S<M'w=@M2}~{iO{^&Z:3>ik[wt>}}} }$ 

 $J;"[5YqN`:d\<\&oUZGI3PJ~geU?z\)/ @" Xv 0?Pff:AN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoIS3#steTgM)7fZ|nHRrv8v?nMGa-IVAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QoISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QOISAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN6'>QO'SAN$ 

G{:e9c0y>\_?lW7txH\$ytSi):]:6

 $KqFdrY0"L2?A/\#ndULGyJ\$J>9^>7v.>HT:kr'@F\{(:,RkYNtLww@"P'M'[tIg3nj24yp,0osGXg8O], Name and Na$ 

\*w\$xodo3\$@^rS

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 $1K2t9w \ @ \ @, IyVGy + \ Qz[I. < (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ @ \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ 43Ox6:=/6?r-1K2t9w \ (0'|r\ 0m\_ElP^{\ } ~ hL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~ hL(t'hMK?Cvd6NKFXuQ \ & hL(t'hMK?Cvd6NKFXUQ \$ 

 $l\&=lD\#o?['mn3_b~Y"L:W:^=~u\#h\7q\'yuOoG>2|1L~N)?5\&^WMda_D\&?n^`nL^j"a8/~$ 

 $T8 \ C5wgL9FO > C(/~f^nk\&G1mR.h''/j=^@dG \ @$ 

 $@NHZm|i(\%Ma3R7\#[O]p[$=Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oa%s]nVYF}]) = (10)$ 

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@ ,1q+s-%JK_Zi8lb/Yd$G=jpJwa[.`u~K.$M:3bo]z#Gv}+m{=+u7]0d7/ 8<)Ocd3OwJiHZr'_z&7=I1|__<o~mf+% J=>X}wn5 @ @uaE>cmo{U+-[s5{Y^.#3pF}XwK$L|
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 $mwMoZ \#e^{[N?jE/j]7xy/|W^y^*\sim V} \{E7Z'N\!>\!l$ 

]

 $V <= mu < \5 @ @ < eZiZO:zpvXEu6~6gXiRv-5+e]lmm?$ 

 $R{/'gg{<=}F{>}3Z;nwk{=}Dqz{+} @ @VY`PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y\&k{+}k'u[n9uRSZ{=} @ WY`PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y\&k{+}k'u[n9uRSZ{=} @ WY`PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y\&k{+}k'u[n9uRSZ{=} @ WY`PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y\&k{+}k'u[n9uRSZ{=} @ WY`PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y\&k{+}k'u[n9uRSZ{=} @ WY`PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y\&k{+}k'u[n9uRSZ{=} @ WY`PUNsM{[.'/lt2gNK/t7aLw4VM{}]}$ 

 $@*n?Xm\%)D+-m\%3-I \ fr2oi2wlqkt|$v;K0gK:g\%?,MN>3]t](Z{ramC\%w6dr\%pG?$niMQ @ @f for a constraint of the second seco$ 

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 $@s[{.w}[mz,mL:Cwi:J,G=jhS\&_,La\%am{KYAJ}N6}\&u,OC?4Uw\r-O>> @ @k38y:?^[gLK:LLLTj\sJrA{mx^VnY7'Eewn6}^Q!?tfy=>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0///<output for the second secon$ 

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zEx$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P*N'Y7Zf{w5XXb
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6@@@@]B@]tn931e!v}h (@@vFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9:G
u-z'O.: z@IDAT c$ !@o\p2X@@@@@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
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P'|j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p)
+XzZ6XsHqbu'loMkpMR?N}*va{g
?r?S^x4`mlm;3OrG;tm{}[o=klWc9&w]&" waj+mq|8{L,/&|]rO7:d
a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:l7'Mb7D/o=Tgm_nMc x9~;,h
U3Jn]w7N<Dqme-
f" i%|e0SL{cL_v% B-XSO?Wsy^=Ozal-6cL{k!msfwa;`}z^z=[av>=dwf/|GvAJY3%\wUW]f#<br/>b
kG \sim slZq9 \sim ?), 6 l U > = KH^{S}
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y)0k,eBJ$k(]B0@BIvwt'z6lM'w`)2xp2{=vW}xnw^=bU/"V^iE;h{)i/p-"N;-
n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v_?m2`g4)yo-370"~|m_
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{/T>)7Ll(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[|!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
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FZO5{\sim}z\}, \{!m:^B><Dz^{}\&+pIZom[[n^hwy]qo @i\}NW]?vGrV?{\sim}vZkfg5x\}nz\) =
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4h5ao-L\QyOx]I\*}q^KcQ|=cvL?w}]hytV:&e/c|^1N}-PF!~zcOJ <y?9zva9a-g<yX@@@:.\_|1rnvRKwv%4j{GwL>9K\_6X}U/i?>sBj1UV^;a'n]sy7nc6pz7YO?,<\_!Plz?D>[vi\_/z@>`+Z=3a  $\{CG;b\}U>Z$ E&7VZfnlGkXVXasI@@@@@Z3<4HjL zoTZ78oGr=\$ N,z2i!I}f?v'Bv~ A?dv}oNBd~9OnnSjg]\_y]o)j)rQjuuu>a :JM0!~%Ez?LV9Tjm ue T:@,6@7mzG==&~r8:LO`cv{<>y0 @@@@#DRfi^[6|}WvAs{7dy|5iQ)it0 L\*=^|"R:`G}O6y]u  $6;;U[n|m<8y<92o\{(c+.:cmZOLmD\{I=Pj\8\%g'.'L;x5@*Z=/i<wx)\}$ ~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@ .RE]zC(:?;C|Ja'5 Tdu,^qufh}eAG/8iV6q<{Ly =\_4i3lvlsYMSv[OSpbx0`9:G@@@:r\_|q{KM^Bljx;uUWY 1 klOIOWd!'Zn.P`\_^z{H;l6FN9j\*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5: H:196 oz;k/= fm/ ?|;r1Tk,.8!Mnu`\_\_\_\_{6\*|:Gq4p77m?N[>TbK\$! 5W{Wg4( r~ s:a~~=j5RJPo]/ol` ?Yn64@@@@H<#1 6(N;[lAm9n5GW%\<y/}{i>Pemj![{5')@]tAjS~9\_lQw8{?.IS@`u[=9cg~gA5"><XMVy 4&Iw\_]gWqa@@@@|.57kv }+N>;^)7?{F^d;mo}mZa\_FJ<RxF5d^0Hp26+[.oZT`Bc(-Bv{CRK ~5oZ[#?yzeIv}tw?m?z~<dv=oI q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG  $dZa>d |11Hx\{;+c((G)|N.]^{z00}|yU^{uh}=16=tma$ 35OM{Dz])]zi6),[50WWWgG@;=Id@@@vwJs~vM6B=3f'H}9\$` yyOx9qo-3g]I}8->nj{%^Kzn4 sXfUW}p6eT Q??aw!<cvo^qA ;@A-a:`]rknkZ<D>.c?\_:K.Q8=J^SO=UV4f5j}D;L;+{z\B!+~:8s{in|/oWlytVwLz &2`x \*a}A%+fut)Sk\*wMSO?k8&;{Wpgz]"2 ;{fwujK 0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B v?5)yzO'K.}cCWEWTm>xm;'f7[o{eYO>b;#5Gy7J]5xO<Smo%kCoeg{otOfW}a\*/MzuAX:B`X >I  $Bww/k_{<yd}$ 8~`^ dImJw|CB@@@:@N!wg  $7bSL52PRpE(LiN_w-[1N;l|b&K?W_fW]!jC~dkzzs]rGvp+:o5$ <6[m?Onw]wZv]  $_307>e'+/e!d.mruzKK^L|U$   $u=B=m=#\&\/#/l=2@@@$ B + f TBY;)s0qfO?y?5q;}-Zj\_mn!<a7x8fc7fr7hn6xE[j~\_vmXqW^/\_z4\*jgybO @#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8\*\_@V,<('zuYO>uX:=:~ zEm f^v!}W15-oz-c~@@@@@PK5!0mt+U\$ZR@c+.^R\nO\_]+ 6grsRg~l=9n2]w~zK.wo\_|%g& @C =xL3f~S`jS-(0gNBg

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~[*;*hV?}]uUvGZy@`!w]r% @@@mJnkw-
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mcKuMO/:d}Ikh@@@@ 21%%1:H.]-L4fZ@@@@@@zR;I <<g f_ #" R}! 0#xv @[
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'@<U%[|gmQUiW_}v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s}4Fe_|E>}t9ri[IT@|Y=chY @@,e1 Xr%m!vwyvg
Do/x;umege>[j_~e]P(7hkYf0`@c=>h@N8[uUme]\pAp
onr}o!zvXb ;*8;`&
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6 \sim 8t - n Ut
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*{HclJ5PkGkAD5Joj-w>~jj\N>90q?X5M%+/<ukM{@amu}gCD:AIg%0lZyD@hmvqEFR9?~.0
zmkxr^xoBmC-B[}~{[$ j/}.]qsOY;ZW#AF1"f7h#>|xnbMl\n'|GCrHJDji@I>T?y]Ue=OBM[.j;%/Ew94vxM|09F5!
kW}?Gy$L[q2,X+i`^E[o;t?O@C]4mnv,H%vum/Gu{B18*9$C{7]OU|\)O!?ePUrK\~T&et{#}9U@H]E6o_>VsxyJY
}mdkjZx?-RW_~_.IrwU*}{
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D5ur-*M{X`J'4fKhneJyuS,k~6-
qt@@V^Uc>.y<wNy!A^?|#q{9^pSGmJ/'_uXP&/L?^SXr1zt/n^dyx)y@:y<wm?<^xh_}m4_:Y?Oe|2i0O/O06Wj&`
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vR|q
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m^:o}|\/>Cy,{ :-
vE1_G~/qu,(:lkPi-<U<@|'__t [{Y
sZl!,@@Z_@MJo?T0J4?*&i6T(
mAo^ky,,,a#G
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U}9[o1Gp6B@@%
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i^5sy~A1WPXHG[01.0YSO=5 :jyW4?^3viI*I'ul>:~6kHeWsN??nlT_|Q60!"x./1+a[)lk-U-
BC!}<]OTWTX&yn5/~M>VFtR5&dy
>U^{T}W^{H}+...
Z O~UNwQY/z0O9jV(*xkY;$SeXiDi,W<VP#T!@-uXC"NS@-
jA}2}~y/_Wqe?la7uT+Dt}1TAV@@J@U|keK5`@4T0G
I5CR?TQ?IyajekY>#w^&}dw9F~.pRLLJ{P
yP!NP*k%H*+2YmvvG?QBtE\~XF5)m
y: Pl}%
?f
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LLt8j\*EzX\* +jSkG~xXF\*TT9{ RqB6.)h]zmI0k\*WtRpLt 8Ic5OIRX|e-XnBtJBdige j{Nj>tN^@TQ-3[VoguywwlAZi=]]Ae\_-T3\$\_3i <SK;#-" \*x>SVyT`Wl0/"`V^T@#~ZqItT @//\*ubqjA<j>sux ZCm]1?-%T@Sb7KtRK.lXNhH6 =+@,  $0N4\bWHyv_Tl!o<N=9_A\%..P$ lb)v{6X\$"ps^ LN-jeTN%\*W,pZ5g\*e@s6+{Q7/U5eky}P5UV:+BN:(X.{#}>%T@IDATUT?}S` n\_nrIT8KR-W{>c95z:PQ: Pebk}e;-quUl>VEreQdZ/RtTs 3WXy<X\>T|"@\&vV"Rs:'\*Uk:Czy# 7xRyuG<>Zpa4AR5Pbj0/Bym0I /yM0^{5~0Ii91^\$y<Kfx!rJlyuM5=&iZK^`e N#n: 5?A5bMu\$x@|r's^<ws41ymq-@#,}5t:\A`\$yO/9'}y}'W"=0{/M/\_5]z(G`z%81,Mk%uBd{tUBUM8i<`j?[\zaya5jTk^Av=nVrz\*i&O@0L:~Yg'D{5}] @JZ?({YpIU\*uOoy4Xwf{-+%]1QvJY[k03:}%?<A<2pYzyZmP Yq}\$c\$, t& 9fgyuox|SAw` }|R@`o^@Di]%-T|]7SA[ytOb)oui #5Ov)b^<Uf%>1.\_Ftij@5+{w) -b|L\_oIm\$\z&a-H-[ RI(Z]IB]\*|'3uZk>J3c!hv-u.CA CRhV[^a UV[U`4lS [X Fm'7z?o[Y5uy\$l,>A]0]1]cz]83QR7]'VGJ,UgZr\*xlL\*Z?{\*lyzc9p=\,^'9^ '@@l;{pL\*oN|4Q?baK\i O8Gov`oB~k!}u>^u^dk-Zb-xZk?x(^;t1mq-V~rSM. 'U?\$C`ZJ[lim9'qMm|L{Z\*0L5\*UZLU^cMRv^=\*W@MLn

^P

 $n{+}x{+}j\&\{sk$ 

 $-y,lk7j25j\% \ 3Ok \;,iU)Mc-8/c1mfNKi[[;^{~}>Lt-LS+&PTcZ,g)Jw[yUzn@@ZF@8vRN`r\%^?Mct~~$ 

UXG7jzeRJPozxS;vj']xnTUR)[LRjW9Z[{8:@nBZu bMP+>Cjv^K.Osi1n\*Smuu'

 $+ u \#: 4 K u \% @JM0 u ZO2 k 1 i C @h!-6: C K u g b U w J U i t^j G T V$ 

 $?5WI,tJ/{\sim}Pj^g^{=}WJ|mV{>}mWd_{\{}^{Knj;S/}$ 

 $) + @\ ZO a \& EsV, -xU[ryFR6]N-q-B O1 \ Smwx8G] qEYbKKu/-v'8Fj6, |>t=P$ 

 $46\{ijn\_nC="b8Jm@ZSu>xq)o1=MK"JVh \&\$l\%6?\}iE](vTTJ4DkGl\$5*"T/M".RCI?c\_1], C@JN1NB$ 

 $+ ETT1J*XzsI\_, \sim J > Td1cnM4KV \setminus R[K9P[om\_|q\{PQK)ET9\}tVYWX = g'i*XH + v_01R + t$ 

Qp2/)`Z6)P{

U))'Upm"m?u{Gj!nG@@ 6b/PQM'TYk?b5[8PPMVYoyI?TIM45c6qcH??q(hR3XRIkT.dXhzQGE]LdF >uE%u]:>JB

E[K5+?SC![W#|h,=\$/g}T0r(oRb7"sn^}0k^^TMn<0<!kU

\*T!

65(R,/j?:/F0+QAz]FsQz?eUVm@'+~~[>:S7vO}?{b8?>\*>GRR!\*.%]

SUZ{^t.)K\zhx/k6Rk)^JZr=9wX}olx/Vj5.QwI~,BC1@@uKbUi#uAY+2mkN>`#e`5^),?

^h iK\d9T7'Z?L/(N5#?{wAV\_

 $|[Bd]b)YW\!\!>\!\!9\#x?f\!\!<\!\!PQBdlyYxa/(xMXfis0Y_k57O@s$ 

 $\{|SR>dW \ e^2drD, y02rA0k+: &o^S?mb, x/hkm[4 \ c2Y], eGe: ?\} Lo$ 

 $9>F8s/lpz<=Fu}^7Z_TJux/yk[9kswWO^{IEljW/p.xkl^{gB^u}|<dk}]$ 

Y}EmNlq~/xdy?KC5mz ^{\*vy`7bNuBio|\*H YGiubA^:Z@@ &)` TBXpk10>P#nC@5?}ULZ}Vw,\PSTn@Nm-We^Zk`{zh/7l5n\*4l^Rt\fM7[\$L+UXX9Zss>py(Hup[\$LS`)~e\mx >r+~[>+ `i\*yY \*LsHeT}HjIb=.pW9UCA6J;-Uo[y6dHjz :L f+!Ts \* '=C2B'W5Yz:k[W~S\_:d<A@huNvNOjG~x#ED|0PN5IA,hPxz5i\* 7T&ov]b B=s85Z13!](S-t~ bmOA XG~pQA9|`vCh!Ki\*85UEK@@kpo2"#`5G|K%.RxI(,VM/7 Y?# \*W!ZQK9'q[i [; MZgTTy\*z,{J? h?-sSjkQz%JXJ\*SIr\ONA]|&\_Wog]!}V5]WK= rV>JF5U9#+}7PAZ6{\$ <<}GL S E\*.%PKU(J+FZ-[5 +gyfA!Jt/wtTQlmRN><Fc @f1~b+y]SYRvp@-?\*Zi7 (f{MzB av46P?-\_uVzygfiqyY[OZ{[E}\*+/zj M/D w}5jW'~ /iZC^(jt.#'K4,m|.rQqjA\_|?mSya^=}Bx V4+>WyT{ sKcoI+Nnw<WPg \@;?Ad(xDcj[ Ι d`Wz59J@@@"[@>= t6J> 5,@@OYG@@@@@\UXZD@?n JB@@@@@\*\*JX@@@@@< id@@@@@JT\* < id@@@@@JT\* < id@@@@@JT\* @O=g!5!pqj"d@uh!l@@@@@v!@@]2 @ h] @ .N@@@@@@uy 8y\*LC@@@~>uG(@@.@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\LD@@@@@c XA@@@@@ W@.@@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\.LD@@@@@c XA@@@@@W@.@@@@X:h@@@@@ D@@@@@@:u>9@@@@@r0@@@@@%@@cO@@@@@\,LD@@@@@c tX:5k^E>jDKK.{X#& kffigv! R]puz.E&@@@@e|aOasjz7|0d= We @`vj'jksUNDHI/ 4\_@X3%krk qiituFB@@@@ hke4 "eUt]) 2 T@'=-} !YKo! t`hpY'\$@@@@Z@l:)Sly[Q\("`{^cb4Fc7Xb4j5\*1{ o}>n{9sJw~s\@@hIZ6,7|\sMIM0^{m;m%s3@@\*!/?Ywt\44'#GonF9n7&O-B}:TU=nu~b~tV[m5Kk\*@ @F<Os6sAwn~u\_|  $f,W_U#$  lCW  $d=eT \{mUW\}$ }o;e^VX~Y[j!e&hw;N;zCo=ONoKh8\_3;{6qb]zwdCll>\_YJ&g(}]{;Y?fKyzt = zxZk-kmVc=6w\_!@ @ `Bj 6hzGK[6~]r56nv|hN7~so^M'=N:6>S >n  $_{y*/\&L\&)tu}{G|9^[/]ofIvR:gxWW''}{2u5c'7n7}-7'&y28ze]Oa'oN)y:$7N9~m%(Y @ @$ 

 $6Xz\%O\|\%WK+wg."mE)wV/wcN1c; [IjKlSNg{GahpY,'G`_k=wm^;vYc;nuzG>hDr2+?f^*,4`A7l`/^|U{C_Fmwf^*Z, Market A} and A an$ 

**OwREr** 

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v;![L.\1`UiK/gk~5uckGL+6x#}|Xsy{Zuuq7>jtGvA3 30f3a}74mnw6ulCgcfU0n.v]wI'& @
  @ P"`Hn_M'FF!4/-~fk[z=sM6 O?1W. #c{3nrMk:W,:imQK+>}7c
/gsoP^};bAZ831^fdM:_Vzu$->lC@RWFn=1$mFWn]bL:+=v]|O8`4>V2;.E0O7xh7Q[=pr]M#"o_L/]fqe|4;1q3,Q?;
 @ @@.Rs)S_=g1B+ ehv's8k:rhv}}`XbvdkzXm,>9<1gO[neMkLnqrH!Fgz3/?g-$=Sox?g=c@\'7|!iR vXo4Oyztz,jg
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3f@u*vqGa`L
oEX_j!r$QP<Q!Y>%]V.s|oqnTpj}Z/Cj{j`I,|&@1/+at?>.TR:{g~h2>FI^{4;Bf=-
}7[{lm-g7@ @ 9?v/
`/=!#GwAIy^juW7rF*CW_XO?_ynyr'V\a9[
)p!o_oq3w)oy@`/CROCYy?7.g o$l]:n{.N$k,]}t6+wYc?QvE}9
7K$cfuq1@:?^&Y:@ @ 0E2>lS(|Dmf -C{n{&xN;l?}Zx'crv\v9T?fg~j|m1`/{a%evn+ymNu%(AgmpD_-
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R8W_{..}fh~vBfd~lgw}gjzOP\&CEo0a7~7M+R@h~oO:==?8u2e=gnRK[:M%doo}>C>@@`C",b/%v1,-(vOMo.)
zcG[img+V|Ov_X>zWuJ?]tih!gg!!/U\&Zs.\&3U\}-nv|sCAkHct4mf3;Mbg]p6JE?g|\&Ky_wr2ey- @ @ \{ a \in A, b \in A, b
 C[nisOW&lR4nrxoNQe{W_veY.>,oP)iSJr~8^.PoSk_$[}U2iGquoAfHX{5a.11WXonZ^hMbOvQg%LB}:G&|e;y}
JP;f5hNn3Lf+ymeH98pqv_{U'''} @ #nuQ}q6p <= 2jhCP_)R; 5h''W_ &H\%W/d]t > V-N+g)P^q#CzJ5b'''A'' = 2jhCP_)R; 5h''W_ &H\%W/d]t > V-N+g)P^q#CzJ5b'''A''' = 2jhCP_)R; 5h'''A'' = 2jhCP_)R; 5h''''A'' = 2jhCP_)R; 5h'''A'' = 2jhCP_)R; 5h''' = 2jhCP_)R; 5h'''A'' = 2jhCP_)R; 5h''' = 2jhCP_)R; 5h'' = 2jhCP_)R; 5
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zd9|=bl9+gd?n6S1@Xq32_v~@ 8dA @
r$z,)8>{'mQvHb9c(D1bd\mtSU`WIpNr3Okqm.=}a{kdrK\b`[z:7`nW;ej;.<n-Yb%o:Im
KluxvRQD=L]]T~[g'E\:>P9s1"|28< @ @vsoBs~
?.F'_Ly{["1utyAlUD1Z*u)0B @ )QYh
```

W|O?.GsB[zi

\_Am.?.t^x l[:cO-f]v/ecgWO<&}dW3O0"aX>XmOlukzy]Ng+vyg6(:kd  $ZtQQU?=6w+{V}vMZ[vi'{j.w}!wnYw_-NXvU_=1u^{v5}8uq7w_UWO-if}-0_ckk^{LN}_-wo[wusJ@VVV]$ @ %P\_;en>2/6q\$,AaPqz?\/;FGG`g7LK/5/+^`H1A#[v7VV[ehzd]tL+-~Ps{3t5RX F\]f;`>c'xM< \kKjlYbo}8Bh6 KvveXbX[Y]:l00z:wV^G/[~[\*]WPg=4>C k/)@ @ 8yGU:G~ReA?ZK4i{}

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Hh}'b/|.ju+40k>o>_5z3l\K)h{6WV49wp@V[9J[m*,
X &/7n3M
s%
x7mW3k{9@ @`.'>e.> 0CVAVS=A?_x^xV_}MU({DfIOL#vip&O,{iwygX~,!@
'AeP12Cs<'lo~:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @
P>+J 0A`F0
tJ&k. cDYsb<}gq#Gc^;hom '`rH-C @ @`&9+F 9sf[h*u%YShB-dmUWz>4/npX@ @
0C}6z{QiAmIk3"%\2=ztLb^~e[fePh
@ @h_!Wnm.CKJJ3-OXn~1@Z+c@ @ 3@]lA+7/<411"-a[@ @ Rv4M|5>,AwH1j&hBFW @ @ ("@%eTw% @
@@mC6\ @ @ `hS@ @ @jC@mR+ @ @ @M N @ @ pV@ @ @@"AM@ @ @
J @ @ 6Ecj
SN>c/xk#M @ @";"f<c^b7tvU'v:\sMr!!
HhOqL28&2,3xZkm8}z8hI{3?O<>#S]!~
>E @m"@M& CAl;lG}}&O>".ZN<puYUXjO?h-M0
mUW=z!Coo=?hV'l+7|KX=mu?O.0m4lwv)Ur
RKnhzk @hYZ7G P}&O?]c
+A):AYeo04g'Md7p5vu:.\,x7_|akUANv[xfcvj/f
yA.}1=z?o3aAg}<@O~ ~~nfs8P~x~~VPN)@&M !9lwuQvu,HMstM+qJd.M`a7ki+r8ZUI@% s1-T[)x
ifw}F?a\3*/Orxw]v%rUWAUVYV_}u+!<843SN 221/0d:I
@cKZz]}FKtb[ou5k1C[-!-Ac<c\m6@ |IF#n`r#?
HYN;-VmK/
^7zrDq
;`Ljo[g0)Lr
@@`ji`A8XZs7WjA}~\)NjUsr:[Dmc47Hk"5Mkuk2yu&>yELX{Jk7We5hnLyn~j/frYykP#$r_"{ayrkGqGdc
?|pK-$b(*_;w T:H@}@ 0.v{~gb,|rqEgRu=LU>rK?hWKz;\"L-]Nb}lJ#V,MV=ck bX`kv3<[,se^xrUu1c$|C=4ur
&I'/j{)K.d14M<wqWG z(!
|G[nPFuh_{<wWLZ:'pz>o
#FZ. ?m.F_r%E'o_d'w
с
's9IR9K(F >k[
$)$>'NF_XRF
r'RnQJBr
kF-}/Vr.L[o4=TXguKCg|UDI~|6Y^1QLg$r.V_|qxK-Y']_?W;V[-SQv}w{lWT%{Wh~:~8rH;lA|Mnk|_1-
m^{z}(fmVyYi)v[X4F2~E3@.h]%gk<~wIL+w2<(A/!)
@% d
8qB8>
XN5!*o?+sr)u,WzU}2I+L\o
J6ktW+
pМ
d[B>y G]tWGYpe*|wmW\'e+I
A^W&Jd;/oW|t[AH]!Qp:b-Vt_Vjo}&[BNt6]pe78FcG;DI3r#L:
qh
bqeJIDl(xPX<Y}
+B{y,]vi}-x^{\wedge}
!O?Jt
nNK1\=y+6'Yy]XpCW<H
r}*nMzT^_1
n*.8^(*)tg
```

```
/g += \{:=)K; bRS'': VZ^{A^{A}..c}z\} 6JO8vcz; NLsChA7Ao7@Ume
tcB:vcDtB9chY]@h:|UA*|no=cJ)(i)v!!>)(D-A?){VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt#)(D-A?)}
RxKP\% #>>pDeg[Q?[XxC0|tfY]r:?_4-Y2H6i[n 4Z-r''E(H^2xe)]
"-jo1.o]tAA_qbSFK)GNm:=nhpetyFF))$O
z > 0SLh/i > + Q > K3
>C>o)+U_5RF`13txMV<VF*d|I_NQ'm4ln^zGO'[%O@Lu5$e{Yi:?jM 2(A_K>}y!VyvhPu
\{\%\ 8hDK \sim S22 \sim dE \ s.>\ &Z_jA =; C//x \} = +> c1ylVxiL9RA
>{{c-@-C@p(#Rj'c@v%l3Fh>$@KCFeUg$@fyGw9(#welvBYI#FwVIL+D&F)qJ`R?ofKKwI~/bZAe41-
iR7JA%ig7[M$e#)Db%-jw{,_vRdFSGRrRjU*w?<kx8\J6.6Kf&KiqLyzj)gV4:Vy:NZJs7Rve
^\>=1h4C2YU&{Nq6+i#f'R*XRg<OVQYkOn>TeTVA@2y:Wy
<o&C43m11
*.|VmbYJPKnkPh/6SL<&i<3.
hZbr
]OvI|F76CM'AB)7U
sg\VOk>7bH\aei?Js% }Z5e>Xb='|rHQ }w+
WPJP{$a=15JUn;sClv:17ee v\;ZL}tGR@Rq%&5uxxl[>64P7{,dEA+e,o z|C~Z"OZS9'?TB,E
I@lmL1T|U < Yc5WGmsXD + %{>E~R{QuU{.c]b3}<m}
0/BZ'|E"?kw<R^Sz?]"b03a[tgEB3(2?Yb&g+pmkPD.]N= j*6G
a#45WuJtVs
Q'UoHc7xKT|#)i>!HG
F$g
@ rj>[I?ALuJ|SLnAGCtN)|~:
,@1?i%d+Pc.O\J#KbPrM"B4(P]{wA@J<VWL*b1bUMEH^Vz9}L+*ilcz%vw71x*Rj,f~^9W
(R]d$4]k.
U8O:1e Mkz^K.#+<#=x>3^\*JsS/V)#$[neXAJ3iV*3 2k~VDKFz* V5W[IgR|RoYvs<;];]R,b\Vs
FzG7:u mQ|F4dps[=>|R/)Yg @u4: @8saTjS<bd!S(wR/+^Yi|^"RI$MEmM7-V,(Ug,_`
3yNZ .)#'vk
IXez2I
fIA^l"wWE c%zsneKKY0*W[kRu]4*V3)RifDAJOhwwr aj-Q
_{iRKlwGf2`DQz)@[X+AVK=K#m<B0z1{?ok~&=w?4'}mSF{}W
z[nLxR3QRyK%|Rl-qVf,>-</Oc&Y")S,;\!1N|@ 0CzsM
6Re>d}$*[bi
1?7u)C}q;SW/Hr;rj/uFi/}N%~V)%Rhr$w@>f'gf/Jk)TZji[dA0RO>&t)t)2$no8F8=OYxIK
}RL[vM|8;aEfhFPctTjv@{%qFAZh\0Um"/!>8;#Ul3Q*y3bCwZwT`|W?R3S
w.tv8s1A!O%ai`tAKm!af@'MA9S
@3*6W]ItTiEzcz &4)=p'lthVrFii$TkITJt(V$-9aLzHx97Fjrz4hk7v/e/r^dYjk[orUJK *A@Ne zd6~@6kbc:Ck]
XE/[9)tE\Ri4W=A2hFgd,(H%~KLOV#Eat-ER{b>XOzvFjoPR5>iGs6UWrnp]eReJ
fehK$D3oKQlC -)FIIRYGCEHiMOeT~)N)]^@Tiu[Cs7^7WUso;M]4{G2DjdF@
iFvtlQzk^=J[ySsmK3J\hwFPG+8v[n)t,?bsK)^=1"dMO|N]AQ
r%|100n4G8s-51g5BA6H>c<8{ td24H'NSRB3tMISA[.z)r#KP^W+@b
=dtA @Z.Z:zZ%CSE>RI4"?-
r'!ED1R)+"]*EDJu)
EEs1--v B-!9QR4u~Wl{Jo7}rK,>bF=xx)Ys.Qr"0--=-bAnWt_#74 W=
H1j>k6dD5pGnnn(^34 +zg^pIr&k,n*osT~h$10pWbR7rMqRBhDJnqF3ed(3L{`=wry}.yaQ^7)s'u4k!@@%0TBm.G
G]VY%F_}guVU}UG6-O1tiyeijkpKhOgzR?H54O-WJX.*QR}(R`RGAu-
"^krk7`\r~1=;.P<}$R]/]T"s+,Iy"cFrK:lC>mV
K,SJIV-
```

%`Rl\*(\$\*FW{QlsH^}`5B'2"AZQYX+m0@Ky^V[l.I2[W{gn1(,\*'~kKzvJgeiy>LsK|fP5xa{lkfKUw+]C5iV~w~\_gE Y,\*-Rm;Flt{5;C4HJFZ+djq,P

 $\label{eq:lesses} $$ [lE?^>:W''$Nr2/cJd]^%?\%.B() #>R9IVV^y^^ cIg''qU7, (pKwK~\IrG'a) $$ proves the set of th$ 

 $qCEJIIPXkP(ax1.:>^>>i=!)j7+'^qE8^wn-$ 

 $DWrniPgN rAQ|M!2[L|[]v\g4WL < e\aze;?S|x+B?]U+)_{\# < PF^{+}:+Ae\$}, wYskg9Q$ 

 $n19YVsNtOV7?y]uO^{t1}=mvghBY\} < DRF\}Mu7\} > nXL\ Wu-rIzvONi(x3bs\} < 6w\{S^{L}\}:zJrqg|k$ 

m# @URtIYB03P9#%W-FpR>4>Kt@5Pc^~OcR;GnzrN}Rg2\$o)UAvEV-uKiefd%\*Nu-)#b)5b3R!|TiWiB-}l)%CRV(&}N{)I\_5}vA7=tizkh/~6[RJ/DJXf

7+J)}>Gyx/Vs. )G\_'e|{^&R~kuGZzu9ro,7`B!eTR~D^\\ yb>;:~OJ,zdHdXx7;kPqCO:@\$R2gE5Y~2f1Ik\+1 -2zgJ\_H'Ly>3!nr`yX\*P

 $\label{eq:2.1} Z@".!D>\space{2.1} zpg t \{Wp+M(obCA2Q/?V) \#W>hc \}.\nBH5$'R p_k2 #u&/B)on82[|6kBMU \{+r7Fa*|Q_g+AMHPZ3:K>^b!WdWREC5Dn+Cri"W4c5z&|(6GcXVAc,<?\nB)#]UMzF)MOXd5aKrcB\o2$tt\S;Am=9^}]3gY:<7:OZy9TkJd|Ep ^\tn~[>$sN.W5\%uP5>LaWfJWL!-y7z5z\%R*r7~KE[ @jK`Y69O>/6h`5{tod}$ 

 $\label{eq:heat} $$H/RT"}QM}XM>MFvv"eBTH)>\C>d>yn),1EoS<^:/>z6/yI'h;N^Q)uUs.KCJHX\_n5-N2JQZ3mLfC )ib[:IRcg -y(w~KW,'N 3#v82F6NOpv(.Hc K}#z/W~jA<all!]Wkq+\WcS' LH : NIi& 0L(QD2dUUw[3wt^B m$@m@6@@']D.@@h9m2@@@@`9b@@@h}js@PC $$$ 

@ @ @h\*M%Fy#8@ @ @.\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J @

@ @\@ @ @@%0TB} @ @ @vvh. @ @ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J @ @ @\@ @ @@%0TB} @ @ @vvh. @ @ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @XNIosl@ @ @@\$vyh4 @ @ @i04!@ @ @vyh4 @ @ @i04!@ @ @<jZ>

XM5@ @ @@

0Cp @ @ V`h+gv@ @ @jH@

R5 @ @ @ V @ @ j@ @ @@[!A @ @ @!5K @ @ B@[9 @ @ PCj!@ @ @mr&h @ @ @0.UC @ @ mL@ @ @@

`!\@@@@PCT

@ @ @h+03A; @ @ @5\$Ap @ @ V?&dIENDB`Screenshot 2024-08-20 at 6.00.11/ PM.pngimage/png9 A<J

EnUsI)-V{!77

 $4y\_substg1.0\_370E001F*Z\_substg1.0\_371D0102*[\_substg1.0\_3A0C001F* \_substg1.0\_80020102*U$ 

!"#\$%&'()\*-./10PNG

IHDRpQsRGBgAMAa pHYs%%IR\$UIDATx^xUOH5 ( bG{/XQEA:H&#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a\_010 aL`0`ca0/d8')QO\w ,,!%;5.Q'{R4om ]sn\$&&%gRtiZ]v'RJ5"e S"7+e]{HHH7hRZ51xYF9a7 L(9cwhz),,,2 'Tr97N<) 2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\,Br[18x'5"31\$3cr SR%19\$\$:q}uEE:QEt]JJ=[sm~\*zn7sQ~6L\_/ 6u]'III~M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G)\_~z<o\_U`'>z.Ai0d%C~\$2gMC9ey'oV+V uU=OnfmB><32o<ZQ1+W?:WwG:7\Ciy7U;;u^{YT,/hocQF,k'|R8/+=H3bDys<5\_'#@.x6vcw'JxG>kNm\_,/+H >a8IH<m\$Y%Av8]{`W^&L# n-vqq,ID4R 8VYnX1+~)yJz;Hmw>(cueaE0^/BCJa)hBK"""Te)re^z\*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF\$.]5/\_^/.S#/"|N=zB &Du

7H^]xzu3DK/Tvu\$\$I`RbE];oms\_F}D5kB{9MAL ;|cCoQ/I\*U[R\* I}D!GSw,<yS>{85.%\$cc;#u[z,uNPy iS?BoUB)yv\$+nz(U>+GI HPHTQyNuRSYP9E}~J4\*K{7mM=d[/Q?JrRx1iXw>5Hk?y0Y\_!F  $W_{Uc1tEF`@1[nUc(k6_b$)RDC]B/dPpMcG}QsBO-4w6mTG\0wWQZ.erZhh)/yP7q7mN) d!F@_]*.$ 12 q1B=OR\*n<pCZsHH rr5w"9NY0Y.^Ifr8&E<|VIJOTX:&?!W)fy27GejjW6OSeo\$:b!=<l:mKw&cG;RCV}\:y[N6J/?%on.t00oe2e,)WDwcd =&0Yej(Q5BGC 64^w?gysZj7F F\02c;S"##5 a6@C55~xft1+5?;PIabL~~?j\_4iDCcn5rkOC(&Nq\$6;GI:\_CP3/'1\$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf`iqqsJFxup\*8}0IZyOCI{H L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z,q,UBv+A|3d3 LIM"B\*54Bn/k('\z `yA`rAp^\$ ru?h[O<-FVr3]Qp>1F  $<\!\!B"zn\sim\!\!F.inXU|?"nlD}S<\!\!K\sim\!\!7:\!>iOOO||D8g^k \rangle = \#Jk*1DjH6m+-<\!\!>qvwUnyv<\!8]R`<\!\!8zYG^>Ai*w=w#v<\!U.JE@\&$ V14#wFlbsB~->[m2."mW#?R %M >5R!]Z90z?((C) uM8hA? 1\_`.\XfsAXnc!6~lb=( $3^Y9Amq$ ;3F-{je%6.E;,gx|QZ\1!F\$7DzyW|;wgh\-TYN[0'ieRPA<>-^\*:vm2>&`TMX0W\q16\_CE( CLXXp=\ B > AkO\O+k]zC[1g"+Bc\/b+L7[a\*<5y5xG%GXF{L<}j{M"8675]3?tWg`i6"rzW~Cn~#<9 'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt\$BE4&)O 6q?,\$@^qC/>|; {~9r4ZyUm7L'5/\*#}\_zB^yQi Q&Y!.tV(\_mx\XwSr'wbwQ 3 BE^\exp-?9D0&52-Qw'|P7BKy :o-;^uh}Mg[!. 6T\*z7UB:Go2^+HP rf P<1;KK&<%z~}fxS/(mYp#FR{\$as.;/ecAj]xxF-'88(:&  $O\sim. ogoOnO>\#<.tFhFzO6ME)f!,Ai@IO}F+3sw!(\J;J$=o;X"e,Wwkp|T($q)a+a0B10Nc!20/a~0&0a 010$  $aL^0$ ; aPdg1;  $rIy\%@2Y#SoZ|t^*)(w0?^033;$ >0M7g+b^/#?ff,b\_7z>|coF}xYJa^{GPcF`be\_`.1>LLufa7azfka~gj}1\$&OSC;V0k&f|udNUV tRL701# 1/B -^4qpQ[6 @x N7I" #vL8I 1 &m00Y 0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3 7nXgxfF`/;Nk  $0L^{0}(b0xg<)$ a5yk = !\*[x?]/>yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa >[|w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad% LLG,;&bkK!rK\$)o\$ BrKHB5aFVOF#'|<\$x\$qew a>vaYla0/a~&?~<x[&;O\_:v"EnLJ<hY>^g;11In|vGK2lf}Km^I\ihcM6?djoK{O]uR>Y#BSofx >xvo|\$wRR34Z{7%GbGl\_]7{t YY>& zHy7ePLqiS=!113Aeo~p%:\_\$%fNLdLrRb(/KR0)QK%:\*A;:L@BhNV;/\$rIhpq;,Z..FGq0|j=\*%hj%1tCLXpB3be\$+ LtHsYlKBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\\$KW6}+E".%iEE JttOet=uP9r\$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu\*/A;J\*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On\_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH\_sRZSjV3L\*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G\_h;vJ.WIS\$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/\*/-qZ\*\$xGi{kU!=nNs.i N\$:9hC:IK%"<\=2h{Zx#\$gD

```
)WS6&@Lx}_+Rjq rcP6pUxXDt
```

 $\label{eq:tx_0} $$tx_0\-r<FIj+<\.rsFs{exiQ+1*TPH&GuxL<K=TD(*Wp;vFFOETd/];""\v'_4Cvc]y2|diHSCSCzNqmt:r4v{~nPH5oSPjy(oyjRhA]a5n?qRAuYM&= $$$table$ $$$ 

 $\label{eq:stargenergy} $$\circ\rM/g^L#4py;gK7V|8qBN5$$ 

 $\label{eq:cmp-A-iKzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55]>8/c%Kh2s+Sd\%} OGg\#GW\_.=n=S\#\WMEEEK1&0K+v.]/xuNM~3]0k$ 

ERjU+8+Z\*UJc\_isCd

j(c#}{9YpH"bPv[u|h5r;

 $mr|A^zOzin/X{wg|sMtAfU.|}d^m6OYFw^]qRX1'DvNCs6n1@[8\&n2]39O]=Chm&0)[I2ug?<6])T'''''hb =z$7jHEC6h kt ~={}!J}Yuq3iBtEi2e/e9R~}Y5o.+WVC5IPGKhYAP3g0[$ 

Kg2\*m~e0m~|ma3<21&MTSO=ke.k>//7jiyLS`A;{O:v(7x5k#</>@^u-7j\$z--S2dxSLyjm:6\*?

3^M7e^Z~1?;W%y8\_8`2qD=DvZJF4nf=c!@>/8/%Jhjr}7\4H<?q]w}v?,[.[bEiVfmjq"-aC!KK\N0A-

@4Cz!)\_';zbPqc1cdK}C,042@1v0F[v\*:uR1D00?FM|FlsA

icuZlask

CI1 ZW\^#3x |G94i\$o.qE9a%'\_|Q@0@P\.RT

D;vnT\_V\_V-1b@;}QYBiOOXB/>xB#c\r.?PQ0`5gF]mFg8

 $Bx6ia.nY_{qA0} wQQDopRbOo\#q+@$ 

`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T

1~\$/D4yqD.XgB6\_e?&wWpa>|;6d #N~lFn8\$vqC5xmb@ A0&=4.DYVZhX\*THJ1PDhQ(#]fIQH

0!BBi]kB@h/k0cSG\_F\_PW+c;kyK;1WW\$OFc;rrI4y^-~u`h1uF

 $0/kx.l\#_5@{HG(c2^*?u!@x/0^;<?99189r!bM)Nq_1jDic`V2c<Vy[<TzTI\$='!y\$SL\!df29fy80Bca]70}$ 

aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010

 $G\{QF[omG>(7|0@rwo)\S:w, \}v\{nwIJ\$!!A?.W_{}\S<X-*5j/ao/Cd*, AAAC\$))Ie*8fG<y1B|>s!1c; WEkaB(S)|Ie*8fG<y1B|>s!1c; WEKB(S)|Ie*8fG<y1B|>s!1c; WEKB(S)|Ie*8fG<y1B|>s!1c; WEKB(S)|Ie*8fG<y1B|$ 

][opcK^NyB

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+SX1cG0@;CZl)5J>i)RD\_f<M6vZz,ukDDD]w%

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\label{eq:solution} $$ Tm_j=\ B_1(=Bznrf=(Mn?u-qlO)=6.\ m{(@nXmA5k&svG#c<zhI&rj>q`)g?F&M+R'a1) = MC[j.c<wUK;o<PBonM:u?+BG:t([n;u(~PtiOs+1F70M@-ZT0)S$O<1r-_~?_G7n8];]1,-[V[!</R>
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# 1.45.1 Available under license :

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3IPM.NoteLicense URLs and Parent component details for Windows 2019 LTSC

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MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange
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Administrative Group

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by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

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Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version: 1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

X-MS-Exchange-CrossTenant-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-CrossTenant-AuthAs: Internal

### X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:I;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

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Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f1485893feee6a76ad1ba6amakothaAman Kothari (amakotha)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA\_substg1.0\_0C1E001F\*`\_substg1.0\_0C1F001F\*;?a\_substg1.0\_0C2D0102\*e\_substg1.0\_0C2E01 02\*>@fEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHALX LX

Salil G K

 $(sagk)\_substg1.0\_0E02001F*\_substg1.0\_0E03001F*1Qg"\_substg1.0\_0E04001F*h>\_substg1.0\_0E05001F*B$  Di

Marimuthu Malayandi (mmalayan)InboxLicense URLs and Parent component details for Windows 2019 LTSC image)EUzgbOSIq:(Zi%:(Zi%\_substg1.0\_0E1D001F\*j\_substg1.0\_0E4C0102\*CGm\_substg1.0\_0E4D0102\*n\_

substg1.0\_0E4E0102\*FHo\_\_substg1.0\_0E580102\*p\_\_substg1.0\_0E590102\*EMq\_\_substg1.0\_0F030102\*r\_\_subst g1.0\_1000001F\*JLs:(Zi%:(ZiAG~M{nHHi Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

bLZFu\* rcpg1252Chtml11bid0 'ch set0 PVUUQW2U3FYkcu ;B7 134R`cP dL364 \*\9 < x:o="Ipn:hesL-m `so-]m e!"w /!?# d"m#@tp://U#.\$'.!/!/04/ ( m"&Gw\*`.w3.g/TR/REC-40">cAead+k -}6\_substg1.0\_10090102\*\_substg1.0\_1035001F\*KO\_substg1.0\_120B0102\* \_substg1.0\_300B0102\*NP< lna#@G at"0 t#@M\$6 W% 15 (" qPum)+ /s0tyle4//!-B-/\* F! Diti \*/ @-fne 0{95\$ ly:"C0Pb!0h"`9 n\$`pe-1:p023=06==a`}8{9:A0\$`</=310pCV>7qSG5r7 p.M!PNI, liFZ}PvFX?\*:0cmA?#z"0yB.00J.:A3",sqKrAm!P-Gg0p#nd1SxO1N|?pP#!`ngPg"0EN-US>a:GnkFs<FRHypTHO!y5c-p8@; 99A:#467886AP-08a:uP Ue>TcED17UV5pU:U!P0@1!p=KLMX%P owP>FRChpEau\]P\_@ - ;J/K?QR> R2s`c8RS?h/2K 79nSNjIndp\_K>Glo@l:r>751&55"/-/5<dyGj#@SIN"T#@KX"v{U967D"w3#@%r $w0\&;xk\} + |@G1@`#@r+{![6},pfFg4~85A < zxS@OTH&i;mu;u,5,o^pu@w?5& < w0& cm^2 + 100 cm^2$ ( 8w^/A U aG.u8avWebPFPjQDE12#P;{C 1 L"FThi2P w@00o8P" P II1 c3 !LTSC pj\/zr \[/\_o8,0 hPf&D&b.cPck'r/\$'\*Pa""etldrfw0{@HYPERL{K `ecAdP?wra+&nbT`X'a@/?3 w@!Pp" 'Mo'M??/?Oog\*b'\5 -P/w`Opl/;!Vr-O\_nO\_o@?/?O\_oI@'81RPIw0ry T\_oT? ?//?O ! ,-#?O1OO&'5)\*,0.//?@aS0@Ocx`ppZ`jj1PX!\_1P./?OI?JOK\_15689:/;?<O=\_>o?@W?BC[`r^Qn"-OPQ/R?SOT\_UoV\XYZ[\]nOoSSBOM: a!o'@33pp13/@L|d 7uvw{|}fo \_oO"LM\_P0pstpHbNpxkduG-x34390267}/2pp329183d0mqlb@xy~/?O?/?OVPqeH@kwg`4py Fr?GAaF F `quFH\_ohpks,Awn\_obOc\_doeghWij0/vSg5p/dy"74}<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2P R11MB4793.namprd11.prod.outlook.com>bLTqGo09 js

+QWY 13579;=GIKSU]'?"B@Q?\*%)-ACE2[:B/Marimuthu Malayandi

(mmalayan)\_\_substg1.0\_30140102\*\_\_substg1.0\_36770102\*IYJ\_\_substg1.0\_3FFA001F\*<\_\_substg1.0\_3FFB0102\* RT@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-

MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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AMAKOTHA\_substg1.0\_4022001F\*\_substg1.0\_4023001F\*SW\_substg1.0\_4024001F\*\_substg1.0\_4025001F\* VXEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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MMALAYANAman

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*._substg1.0_4039001F*[_<_substg1.0_5D01001F*$_substg1.0_5D02001F*^`$_substg1.0_5D07001F*$_substg1.0_5D08001F*A$_substg1.0_5D0A001F*$_substg1.0_5D0B001F*bd$mmalayan@cisco.comamakotha@cisco.commmalayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt_substg1.0_5D160102*_substg1.0_5FE5001F*cg,_substg1.0_65E20102*_substg1.0_65E30102*fh_substg1.0_80080048*_substg1.0_800A001F*emX_substg1.0_800C001F*h_substg1.0_800D001F*jlY(!eyJJc1VybEJlaW5nU2Nhbm5lZCI6IIIsIIVybFd yaXR1VGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hF ZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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"LanguageScores": {

"English": 98.21429

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"Language": {

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!"#\$%&'()\*+,-

 $23579:;<=?AEHIORTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz|\]\sim e;DNRT=Microsoft.Exchange.FocusedInbox.Models.Heuristics.DoNotReplyFeaturizer+DoNotReplyTypes;SCAT=SameOrganization;RFV=1032232302:-1=0^-1927059262:-1=0^1146315108:-1=0^1810071250:sender-4814ba42-62cb-4d22-9bd8-$ 

 $754c802ce6f5 = 512^{13}52796317 : recipient - 2bbb022a - 9d21 - 48d8 - 912f - fea5626843eb = 1713^{13}52796317 : recipient - 00826e84 - cdce - 4955 - 869b - 660b92e52172 = 2561^{SV} = 1.0.530.0; SN = DM4PR11MB6405; MV = 5010; CT = 8/20/2024 + 12:38:30$ 

 $PM; ODF=Inbox; IFIC=<null>; HDTR=0; HDTF=V15420240627.08\_substg1.0\_8021001F*\_substg1.0\_8022001F*]$ 

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https://3rdpartysource.microsoft.com https://

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gCI$@$@$Pd PdI@zRJiSX/b<}Qrecb~AmV w}'|$&&F]6B&X{=>jVyff<wb}R8Y@LSFMrI $V1kWYjRmyV
@$vU
otDS& &@A /G$f#-[~AHUVb@8
pKMeA\tE0C4(
0saVZ$E/"Vw'F V a.|aJ>
w^'5,-K+?!$.[2Js!.1CG)_:sh/7\;G pQ<O8 mV+?}W 4TRW{
$Gp=;G]^
yb@-K.k
g}&H=b#%`U@(1<jsN+0adYtqH6yA:(GNp%{E|!K
e<Cg! @9N?jw"# "
QH
.=h
hFyL+10?c
6aT|ytNG<;D;8+YgTuSJe%2yRfMg1I #/6U=z3@"F=x)IvDupTz)Ws@T1 lm(d# *FR.K$#p'Ju4K_WOH
Y6\z(\% RSSN \{!dOE' \{e\}FX~Z\$)
0obJ2$"^x i#On:g4b9 3e`!eG# (|(k @8\Y
vZmB?{Gpm(Jt@hr32j Q+T O+A<^U6a=8(p[2>
*1 KPF$@$PP(\%0091KLpi~x;M;4*aAFFu?`v8-*HkOfiw~Dfj#WAWWa3 ~oA0
7 +cP[79U-,# Hyfqc9Oc-k!i_O#3//f]3[o@p
4cGu!6jI MN;SC[v}GH[of]S7f3\hktG^Hol4
;L[R"?^=Q#>S_B?U = \{ov9c\}x!pU&>bD]\}1Vs\{\sim wolf\jgaq;SU[onw+Bgh5Klew]
k[gxSXGS $XqY+X+pOo{(3lp^+)Ns~:`OdPs5Sz iJ-J4\5s!)WL<wi[<v9{eIJwV
p@X\,5mu\{m0tdgI~\}nO-T
:4S7;r q
)&L4p6J^>k{14
!)f @HB p&93N;MwjGH/D@s1
`2}8B|vO
fFb3fbh)3#/$of]{2\#G/,+Wt|A n=4h P:{ 1$EQA uoN<x{O>1k8xp?\pVS8RR7vZ=AxpuwW^ipx2Ew_8Vu!#!;
Kxmu=y
11cX/#<b}L;cg?<w9U_?8#/GDTS~gy~<7xi+N$ z
qd"^h})6O?qy%[N4Bx;e\{+K5/-C! rcrd=r3[ *,? r(6?O2KU
D&Y/;(8FVx\i9u>m!1YtAv
(f}7G6mnt@F0:
lp, F
_-W% JxQ=q7 ERJ:'w[BGNcQlmscZ`Cq,3%J50#!8aq6]?X9U]7sc0-
V22846,pO>p^P}K]qM-wCkBG{NpW<p1S}xFxV /;!]v198wa5]`sgL+LX`J.y5?>CTuq^fm:6diVxt)1='e;a$>.-
NIMoi:4{yzsW`mR3}y+fd8_Y-I99/_@s3?Xu@mZJ)&e$b%F>`z
dWm\CIHBI$@G9M<L)YdP;_~O=&g;V 'T%gU(c u+,<3N}19>>>^!0LNVWm~fw1cO$Vh{@lsl:CHN8
9evfO<9!ALef9+KXuBn{O$|~GwgCa)SBB/Vff
s} Xn
```

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!L_|>za1#tmvi}ei,?OO4*2sHf[<{&~AVJJZj~>Emer/.P\,eR^N.--UhM\q@=eHH)%7]\N|>W]v-
+WUkUon]K*QnAG!XYRVU! ekyeWZN$@$)
q$@1GPpf`E*Vh9MNjUSH70U~[3u28W!7frh35(q38B!
01^8X0
Q59Qw//}hr !ft#B<Pe~Fm0!`p{-ZQPbt/ z8?iL?[15sG
)B';p~LI>fsl ,>!jVL@i}-vfo8h%nTVl?ff$xMv[)IeeG
58}k3QV,9bBT./mU+[e]b\Y9h\UJuZ k+#bZ}ZA]7@X T]YF5 FUDMFSh\B67;h, "H@<e8R fF|.G' nV'fRA2Gv*y
\langle Z, \rangle;8{B
803B;!At\ $ERZ@H8Bm>6;N<DkP|ya %V-`Yge}Fh N>3M3QcB;x|60K@T"yj9(HgH`MC\>38/f#b%O^VxXw
\sim N[q\{pGOk]G=^Lb+nA@pC^tEo,7mBxM$/(+c4Wwm <{HH})
7D%S.x@mN;1Nns;72"jjxe{5CPZyc
6UaAa4=fsbJUbYau_Jdl<P0OZ[>a_WHIQLk:Hpss}k5\F~8pT
G{W!4dBem+jeOv5uI tHH7zihNz]Z$c%;YL$t&C y,fE<e8LL=LG`}3"af1N.9"#]7Q8
 $D$XE:Id:A%$$X!n=?~|3zh+W>`@(pu;s"3U/D@^?UW][P\?>.w$eX98z
{]w<oP0s{NCosam=X &A->/A --MwH1K]@lNj=seH3sgk/`=uP+\!oGdcg3YPcJ-#A`
r \sim +8MJ \sim LzLnQK(\&G)qYRrFp7u|nI)_F !Xr\%; R`Oh\%6Vz97MDDWZ < SEkqR!uT
Ww_UOj%Z]symB@jcb9D=RZ5[.yLOVA-
UI[+mmSx-] $,8D+e \r y = \r 
m5ZTZYn.j0vy'G9dvwg#!M&Tt>LFA$@'@A @>(hDYpA8
'[z8ViY:+(AO7$N81[W7 pL1M2W._~ 3CH0k,6?`?p
u;(1::\&A?:N0 < NTv08B3 Z fbQ rcpl, f[1.B-a + X8)
m{YafB:uRNep8O8QJ0vCj@A>o=;{k[ogA(G'ncRD={Q
c]yOd?v@e)mg<6+/O vN>OmEGdQwjS7q4*fxq{fjNuvfm{U{<Kc;
rUik6E
}rBNab=r_dc0PLvlh
f{9::-"vg,*lSwZIM[3e*=2Wt:,&8fy{kz8(pf/^?snRpt
lEvdGw=E]ZN:GhLJ]x6%hEn379loY]^E*$O gZ5/mA$Xk%dn]*eY^Ju7[RJ oy3}wH$@%`r;WD
p~eLJ$<.tr7bga1cb}f"?3D]-A1BN&S8!mQ:?6mj(,]SX +C8Uy5nX0Woz*
8uvGAtr!$N^r'n6 bSM pVg}|uy0}$'
at!v3MwAXA>C/V!YVto_`.30~v="fw81+JqtY+&8U=je+P-J@u
+jEd8Gdm'K^X
kt[n3c%?2T\5ygEISv$CF|vJTy,1 Udz
2ix<Dp05"1s:e#nuAu"^$cWwL=J2,c#8dVKJG{+
VV"&~S)QsTd=jUjTKlM{a{HcV9#mwj}~&9SQ"6R*$[mVvU7m,ANWrJ[[wSh$@$@'@A
   @0 ec.A.N0% leK% Mh)N339DGx7f;0
*
`=<vPVOh
dLc)Wz
bqrtmDBb#g.lW87#Mum`6iu[gp_cwgU:9>7 fzx\}a!VXc5@63,/e3?^Pu~5 [1 I;Fw+73&9O2
fxl3d91s//;em,Usq_I.Vaf^]XcF6BU!WV:$C_W9-vYZjH`Y>gv[,;P^h(^]Y
S^Vip0olZS5NZ=h^\mY!L`tF8+dP=lB^ Y'DU$?(U*cjKPJ1tOd^0>R*T J&{Ko 6eNY
,~J?] \left. \frac{9}{9} \right\}.9hyywfla+~ Y2[%+a=+|E, @_$@$s0+s7o uLBSqX>}EcvYIKutep*8ap}X[
G>["nt-Al1F]q5a]NprG(8uLhq+<DcU/l^tB4p+&"1Sxp1`m1C=t5\fh#s,<s]+@.Ex%Sh5mUTan6]]gi=5SbR-Contemporal contemporal c
<#]x?o91i?)Mp{_47dRGwD|OwZZSR~Vpd+k,hsvdRu?;Qggspm.BlUa_V>\}YbvJAE-n+&uCeZ"~o8[Zu8o2,-
|Ib|DV(PFN9v)
2EgCV7imPK?\fJ)r\1UUv|' @d# @~so .D6.49mkWw8^MfjuRi48Lua!Uq:'?#tur'# ;uA0=CVgeM[oY 1k1p
!p>];F:[p8eBLE= Jf@Yf[
yh3ZwDX;y<8qcJrd8.#4C;`Z Nvx5B48YB
```

EV6Yq9Zq ep[5.mt7>\*d=6\*Q<Zg\_&k[]B/y,rC,tdpF!IW;Wpm8.K.0dpaJt t#WY3s~ 2rL:E 5hD:X^yrgK2Y~m 0 dU V' X&\*p>:AUO'7|c%16 8p\$-^1j3+VHXA:-g]Cq,t=@G :axUP3V "'/XXq#nnPXmk9:s }`NKrw(ae.=3AV3C{6B}6q2bL ;%D;qA+6'X)HK9;.#U8oPa.?=kd,V;>!o:%^X%Hpc9Xw\_05J,I@[7 uAYu uj r[Cr#ZR 8g4/#enae~o.5s VaSLrFZy08[sJl?mn^urtwTZWCa@ ? @'p'(LwCqy7HCB-8k%5k?Q)x9"uK%96T7O\*UX/Nip/P ^fd]<.(VcP/j81JO]'TWA s|HFQBgnqqC''\*OnkpW|g^qqLUP7@2y<W9#\*J,?V7d\_Yd\_UV; \$rIS"eiZyi;JJOoGr:J\$cU) ^C\$[f`Xp;Wx}Ug%?2^ 8qzrRSJ7sq@ol.S\*\$@\$@PH SN9E;Z8 yn6I@p<gwH"{&\_X#W3x=p (B8(\$-;g]e\$dB Hfln5 %\$\$\${a>o=BB /-/IZm.~\*aCc>|110\*8rtu\_ u{)|\*)fV,dg^&;UW%z9umEzD"`L<\FUpuzvcliX"\*e(Tb\;zv\_wuUF>L:kvstrqg79\*;FzahvGSIir5h+P6gH;\$[YG~\7W ^JCCoQ\$r{pWybdjQjeEK4m@psH1TI,vmzA)[Qp6 A ~q1xV% J\*Iztyt+.0i ?Z`c)A^iiiDooowxGJAPp@9# B}}i;a{pc5/#XK/lQA(Es!E H#fY<qNZ@p mL\*Z@o-X Q"wkYaR:B[GZUJY\*v|I99`GX45;M`\*`y9 #5\*Wp]"\_<]ULc)mq!C ?9FAK^=>U%Kt//1WF}Xt5i+Wt~6 @r>8UIH ,~ m2\$8\*8lxX \$cx&aigiVmjjRt TWv#>sf6AiYMG.=.\$B~7C\$ L]vVp)))sYIM}O2E6G G-`\_!|}gTnZB2l!Q+xomN<Z|'C^\*\_'}\*/]PafYNisvY+'uW!6|Yva]S u#i03;RfztyAGKNKSx"v}XBf[P/XruY=g?jWU7/3PR.1QK | @xwk @L=@IDAT^fNHep06kL~ ;d\*iIGp~vyZ?0+QFr+>83 XY8.SN2vX|K,\*4`@!CX/\$qE\z8MA@\z WPpmG+rDb>c\<wku Vt+a5[1hG`y'|AW`RxhB>?xq{=Vw[^1X4HUcnCx5B'haDNA19guo <XN:va<.boUcg6h{eaLis\,!y{d;KrmLyKyIh}\~~\_n,g|N!LI'eRikv5LPB21;?'\*HnmVwj~ i[]VU+/U}? g/6MH Y]&VVI/M'kC^%Uy;=6p]>kbM]k-8U6n,;w(7\=0h-2i@3'4 P (L/^,pzOquUVYdppk% B PH9nsAnAi\$=4+0h>1D\$SFhP pOuST) !9{]y|,o#l[x!:A0J&17ZG;Va<+r"5z;w+P)AQuo&GRQa`i6d%\*x:1ty\xU\$CT.M;w#fy n +'2tm3Jifx>N\_s\$yt] 7>IgyiJx< K? \*D!+2v|t6ER: [O/{d) 7\:\_5+#Kf1mSQ,VlQ!f--|%D4;RoAHpy9VYtx:EK!'dVTBnh\_"[H`u=mMqr%YUROh6d KR9HH"#@A 2n<H 'Mr~:G>`6% 2ipd"Lna,C<;hpye-[466%KUYz\_~ep Rj a" T lEr~D| ^wy|G!D8rkHZY rSHw}goqpB !s(Z`wBuj +^ziZ)YEA +r"]|"&%{i~C[~(:\SAn}zsAtQp"lNVY\*pBCKfTc\*Qp//M1#?z]qXOT'gHA9|)<R@ ?NM?KJ{6HJFK"`TQBV.XU\_Yc5(n;9=3xS?Hw<PR v`S \$'6\_vyGEVZMWF~yV~ f[I1]!cO~&D.'?xOS5+@mZ I[y2 rsm iC# #f/uA]IuO# 6g2!LH^D6x^xn8RC)t>t(9cP{Wt M} `FI/]h8d `rC9yR"y]ko-[6L@hAKr`\$}v:EZ!L/o]}w1R/bb\_8N:C c0 YwJ5sO;3UN|J '{=r>aV\_urSs %`8\*\

## W,mHJ

```
sJH K[CR$5
^7U5oIJ*u=]VJZl1:YnXN/NJYbUc~]{*Kqd)&y'6fOJY5ZLd[KciU.5dhmbj9%]{ujWKH$ d?a
XL$@{mBlx!E#Lj_lg9=+!Q,oF? O8Q[XKTX&CP}o/v.s"<:Pu~J+
O$.B"EmGyT?6p{uB=9-[9I'L`#i|=Fa"W~Dkva;/A
Dm1*AWZ^bLS9Vm!Xw
$zq1VIeG'q!|BNIaNOww%V(H]%`z(S&Z/M@d@H!+SxzzxxuBmyPUGE@r`Tp|cv=$0 %CZ`n7>b|@$ t}zxS
*]j^91EIU9BLu3g |fQW>rwhZqn,kv|C8!TU F$@$?i @Agv~(<f:}S1{4{$s>|xP,wn[nq~O9
:3wE> eX503?/gQ]}\nWX2E39@?+<y6}>$Eo[za!
`u]q_Du{: A0 J\wubokXW/i2q]aLg!*+|}eb9^{b^+hv["8,Y9Qk8y/-@}FSH4<^bG2~`&~b{,|.u~kns|RJ9D)-[e;F
^xyv~_*;\rCd7j1x+K;]%sC[GUB1 +& p /pG$@$e]Z-/
euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh
A@6[yP|Bx*Yt=<Mp@='oUL.+w}*\sim d*y]g+E#*\y+Q#^vk7l \sim=G[6c'?]
5~uE 8CYQn,qn3g]tfb}cQP;^,_=c e81LcL+g;;?j1<m<8
!P49Ss9JRjGh DH0Yq8p]b! m:7 M/_j9\?L-W!\pNgOIOO},36[6.%&nqO"Q{ {#_FFr.xLMTy=s5v{rq!Kq@ugx
L)+Lz{Gsj23 >Z;[qmXyYBe{\$@E}gY1rCOy^ m7_SPdMD\# =\%coH D@(
z ygAakyK7Lh;X:$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe
$paUzy 78?~>XkWc0`&n' Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6} )VqK$A
pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:${X#(0#THK^ gs\gF|7*NvM$@$;\!;~<H
r.ZUpUT;vt9Zb!19PGA3^~C>14>*3fp.Ua:z)>jNf
fu~
Gu%u(+`bZ 8%`\:"q|%T/13g"S
,An?+G?c
URx<o;wn9XPNi]jwK:D 4s:U:w5-7]wXH1yRhcKk{(WJ.9j& y:bd %Jh6fC~goHq'f#|n
v8v + b5jlO>z /
!b[Oa$q
cimc=T8PZ{U+
Y/
0%uKG-*#F'w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg
mf'}|wY,v|<ap3B@ASZ?!
! ~?
#8VBX@[B`O?<
33u'| yQ#86" ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
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EIHrG*C#?>;bB_~p2fK#/j0JFrN`kc^06lu">&M6c[nP}.H,|lUV!8a0:99nu]g9u,U7$7[N+B
+r2@Bf.wSP~*QpGpp\Y\Fp3o^a+uU,>#+yv4V\1|\P\ 0\8.dYW\K2sf"H (d{/EuS^w})
P"7k+e$j(%SRG;]]#++?;6h`8eR$-4E*mT0a$ oHp"a/a7n~#1Nw8,Z(w]>F[$ll|onJS4~GN
cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$@$p(S"
   ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
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                                      ?(:$@$@$@$@$@$@$@$@$@$PP('
     ?(:$@$@$@$@$@$@$@$@$@$P P('
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?(:$@$@$@$@$@$@$@$@$@$P P(';w D:tbICn
   M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH$@$@$@$@$@$@$@UXH{[NrI9CjQq$@$@$@$@$@$@$P8 P(&c+W#Fq/l>oF-[f0
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^ mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/}z+VVO>4lN>d0`3>
@W7xCpp<\=4kQ:ukg|RuSSSs~Z K/MGRF
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9j*)VX:>-(*
0bC
mqF]l?2i$;w.>SO=%wqGP9
&w)9%4AmKN?t3gN>.7xcSN(vD/\~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+_`8
"%\bgbY%ew{,'{
6>8
usx-.#
       "P HHL|{W }t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
g:tampVC tx/#
fIY3fnu
4vXkE^{};Pxqn+NW^{1}-H.92+nkA
!L=Z h([t5>a7 `@_,X UFXmip
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiYjF8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K_|0IHHHHHH,h*
GVeRm$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r
xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK_A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
T[.?x# r
O~" @!3JN2U%r {AeS3d
[lq
j%*$/un^[|r-x:)0#g@B,z3zjor091;
y|0D0(C=$2x%p`<`T1M; rB6g11# bXz={CrO$@$@$@$@$@$@;g
H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(_[n':Q5IA0*_fS0nV#NCY_+WsNK]Haa9
8 p~ 1BH
fxC:F8(6b_lLizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku_aqeJfcpA8?$uM[NsZZPFNe!f&X
83
GcX&{`($@$@$@$@$@$@$@
#Jg1q W%\$
@;J?f#W7aW"QF^BP9@R^sa &*`yg$0@[o0C-?)k_
g_hmf8mBL|E(F [0]00v
V~!zCNc06
HQ)$@$@$@$@$@$@$@'Ag3IF24a6N
YSP1e?K(IM"o)0YFw
```

Iux^'XaM4I0b&\*6e^2fGz6Ei=5=aLD^F0[\$ aj^!F|LX6I|a1!\*<yqtE9g,\$@\$@\$@\$@\$@\$@\$@\$@A F,A\$pu/ N(Z > b)[Kie]pB8::ZL|??6l mu'1,hB4i>xkyuky/Em{O>qk}unAofb8BM`2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq \%8w@A E5P veyk3gbC}-P>kD/oO? o<LG<G!}7n[;#>@71"  $x?(-3\&B8YF wsX9-(olkfU[ZEt'8"dh0 L F={o}))$ GKMkf<c360|;1 ,kN{=]\$6^^uNh1bf\$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC I/b#?F wU0b}5E|rCa`FA}R|fFmV?G87|WP%Bh4PZ\$p`dgB8%/Xg"O?TI}Fbf\$xA1a@"n;/G{.>^p~E~WO\$EhzJ?HCNII6= dnrHHHHHHB JLr~EV`/W\_s='&y.\$/7,[%,<r<3^5aDJ\*>=+JW\_}Utn7U0+PC-S7!T0]]?yRS%-~0G(P Wp>QXZJ }q0:!)`5>mm&Sq!00b]HfPHHHHHHH|P5.RIrf2N-z{Ix w;=3Ycd\$rY6B\*IhQZQj/@<x(0sN9pG%Q>:wFFitE~o[6<x7#:!%!{xpi}a(@H+Dl`6I]"R `+rHH\$jQ w|Axke!<O[\*@%|4lP)IA| TH4T" s?aHHHHHHHQcPJp8)BPY]"\$ { @ \$aUjDdf ORHT #0SY4m)fX?JXDI\$@\$@\$@\$@\$@\$@\$P1 A @)jL %)I9zU0TDb\$ {\`!aun\*^}J}\$<Th(\$@\$@\$@\$@\$@\$@\$@\$@KTB #gJ\*Oc@Pd!1@@v,>uJA%-J2dgHLW3'0Ac@@:vd.)X;+SN0 0J `ZHHHHHHHHHHHL8IW( @IA^ (Gh(G71! "@@Ie\$@\$@\$@\$@\$@\$@\$@\$@\$PPnB\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@%@%E \*}V\$+}`R~quYZ: {"A>m`\$@\$@\$@\$@\$@\$@\$@\$@\$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII \*I@ `oPC}zMOV%P "M6I (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4 7@q({OCYrPRN P\t @Y`IHHHHHHHHH 3GpNb9!0Ac@v2g8a\*}!&g+\*^SAY0 R"@@)f3\$@\$@\$@\$@\$@\$@Ft\*@IDAT\$@\$@\$@\$@\$Ph(KIHHHHHHHHHHHH PJ %>& (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eIIHHHHHHHHHH @YA.m %>& R"@@)f3\$@\$@\$@\$@\$@\$@\$@\$@\$Ph(KIHHHHHHHHHHH @YA.m (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eI,g\$@\$@\$PK]2%"4PMHHHHHH Dba (j%z"&3S{+eGOC7~=e`#%~\*[ tI:uJU N -LR/ w7Q @&@@?F!?SJ;+M}'ZS\$wL.Y7]'OI ;CF.?fhUk{+%&Kzk(A2%HF- XUke\_ri##I4S~]/Z<% "<gy,0}\Yr8yR ThYoM\* @YA'(29t[N{;?P)J[65-[)} $2 < x ~ Zk \$ NW\*Kt'Ks0w3xI:%++; `gITYnfM)zs :"}9y2{whLf,ZV O@o7x%5A! D Vk!@\*Udn  $PZ;vL6o,|[>#=[r+VwY]g_]|(ZtlJc/P[-ChR?XFXPb0>{+1$ pIt\_s !NVTZj?s.3= O#^qNWS~T# eq& @ADr \$,}qlN:-[1c;%:#w(=[6GD[x'pZq>qIxa7HAxWcdU%\*R@wB\$@\$@\$@\$@\$@\$@\$&\$c!I( <uCiii0P k\_ {ymJN6MCaoC!Ct;k/gb6\*2'B)6lR)+jdtV({Az(c\-fz>j=TuBNU0Eamq\?[fI^iK {b} (vkvyo!}^8qhROC2n8aJ?Oy,]&vVP2@\_SdTT<jvl.NVWE.0W<Ki8H\$}\$k"^K\*+CUVnKOgU[2=hV/Dz 7TkReOo-U~ |ie^^;%SJ'RN"#&uV~^"|J2-3NPMw:\*'%bHy\$t)okG+YsUrkdr Mur|"[d2;/:^/M;du{!9|\$A\*U

```
hy};+dX,P?:H7z-jzB?W(s/+WukWV?F*hs@KqZUuN.^ia{OY%9?fS_y569f#@?v
```

```
v(u.YllO$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<*tRSrMg!>>rAVr'JyYYd1IW
```

```
Vu{IF3\sim Ucx}z^MY>@>gc7>6Z-RL}oP!/Hc[v{]&
```

(^4/OF\$P\RR.]>+ygedYzo6^BxRhuRJ\$~F'EP-\*HzC2"SiiI2WQdRJJUINa1

]m#\*U\*>Z(N<~BQ.:7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS

```
\label{eq:linear} Jip;x\]\a \sim Q,2U\% vra7G!2<\sim qj^vv\{([\Q_ks\&uxhlC>W>XKF 96\[2QrrlSV,wHPpeA\]@B?^,_Q9K)+]VA@pNxR^\sim c\]q(w?Ir+_r/~"*'N\&)U]p~Uca9Q\}|<\{29[ezcpBavYKz k6I+7HHHHHt8UJaB\]@I`;&:
```

u7EIFd2ydGHa89,\$@v

90 I&<W\_y2H:PbL3wy3xC^D+U

```
\label{eq:kprne} \begin{split} KPRne[q.c@!rMJrX)Q&rkGk(/mN6\]m''K6iEk/\}y\v5B=^6Q>2.rR\ P:U\ LQv*2\#uyX<)cv)n2`Dq5[d5aTdu4k8PM|zt\ OSf;<C+H7o-S\%\ womh\[yVJe`Xn12ro2kB''5cVa]\},YF)<,vntU+' \end{split}
```

 $\label{eq:alpha} $$ q@_i.SUy[?ic]7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2)] $$$ 

\_PQ^v

 $9<\!\!>@aV<\!\!0M;mh\&|Iy@A^2/YN-J\{\9^@_dVYU60\%-5:eO)!Q$ 

```
\label{eq:constraint} xw=ZOHHiBV; 6n6ydui&iGNoKq2O\?~2KL<C.(SSjeL_;f]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}7sS=HuO{U]#of.:#Os_|BvxKIr AxKPWF}]
```

 $>)`\$.*PQ2:DWHzNJ0\{R\_FiD.urRFvHduS5|E/$ 

`6e.O^=:qk

<PFV@

:f8wfe]2zfP6??0b

P[

O3@WN>\*t(&(\*=wT<`s]C!w

```
a:rZyV3 < B3 = pPe(mBySn`*$YRB7?N|:U?Z^{c=05*r}SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k} \\ (2)
```

djNE<zJ0`F

[Uiy

<\_&

```
a8OuXV`nz]0.,||3CD
```

 $>*J$@$@$@$@$P\%' p=zSjc_,$F0K*;v:tPTXv+I.J $&0g( oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc]#fkXblm1PGU YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]Q GdHE}PZ#Od`uG((!69u<ho7Q8(wi`/_U(m'{Wu-Ve}V)9rb! v+`A{o!k*OPDG|>z}S Ka$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 $8p+I7o))$ 

x<h df`<xl(]AjdWra oI&<Oe73ty#Oh61oR3-

```
GHWx0?.E9tk6\{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m\&$x*b0;x\{Ktg#k==\$8G)3i1u(e)B9Iznxi':.\$FtlcV,r~y? ^v 9mt(b\&/ga5tP{'i\{w)O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj*rq=;:PKzOf m<ru9)GxB\$@\$@\$@\$@\$@\$P^nlH@(^Z
```

```
&~-[T|nvYtiA&W\!y9=*/=BtR'6cUum5TXc\%fwy(_7WJGaWVeLye @3.v#_[Y=r12zU-F7mUV_bctRD*
```

```
G]1Mx#ERnT,YV.tJ~XKjj+Qy'ty(dTnr;zY'N&f7}wc 0
```

```
\label{eq:constraint} \end{tabular} \end{tabular} (]) (f;:f2UU7r?XR1\_VCn'Td*xOxB1~\%0OGcDRd< 8\$l6-O8gx~I]NaHLC!
```

```
\label{eq:constraint} $$(76B\&@\%O\}gIT\$y_h{1y9z\R=V}^*maeRCbTd=^1|ILIi0wzA2xyC\%uYT1,I]o=S>G]LrC_swX6]^Sp]'O${vR=Uo@?Bv^qQ+eam'WWRrsH]RMyD8G'<Bv:\%}
```

```
P527GsdP>>K_wg?T.f\8!"V5/oUr>oF%a6#-0QY! !@@pf+$@jE(>>^>} d>9q
```

D&07]

iQy\$X>co

 $S x 2xX f < [5yri2{Y>MdyaduB Wb8BU2y}$ 

```
\label{eq:starset} \begin{split} & 6\}(/KhfSRb,?Nz'v) \#r!f.?bF\&ic8tl2uz\}A\$OX9\&wIjg(0@6nYP"c@joFVLJ.%wqr*jA\#[d5Vm\{+7/&O4SI\{-O'\$5(SS,Vrs~Y3) \ \ \#@@fK\$@@tt6\$'\{z(!lk7C_"eA\;2d2!_3CX-k>/qA`s\{g*sscZ\} + \#o\&/g!L(3JMW=19y5)\} \end{split}
```

b4ytW0rkB`ZN<)P?\$[>tnQ\*-S]';R#BB/1U

f

dYHN s;De-DFFHrrXg/Si\_]x.U((#fB 1hVc&?K3o6SSF

 $BV\ Px0eh/e\{wy5B \$@\$@\$@\$@\$Pz)=lH\ [u/Zv\%4win\ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.show t_{a})=lH\ [u/Zv\%4win\ dYHQUrKRdnNt_{a})=lH\ [u/Zv\%4$ 

\*HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+".

:mP!b[zDLUgerJ\$ddV\_?\_s.Q5u@eG\_s@>Z&<-<qjo

 $nSC+="fJ(Q(@)hXIR39I>Nn)#c0_H<SOKr?[pCQQN^<{{GkI.\%_/f^*T}Dx~(2_ts]c2kKjvP@BUc1{?L&\#GS{g}'5 Mid8M~Zu/s}}$ 

P|)W,g{ch/dJ

7s`.w^I4]CT I]{yK)>\_z3e0',[AA,/UkISgt\eTnXK \_#v@y

c|)U[]]"]7ca]^Ei]f9cRop\_g1`Kho{Ms'%)#{#\$[#!O}Nq}Y8q[5o16one<6PyC>{mR 0~!V}\$@\$@\$@\$@H WQ) ( IIIysUwQKSl=K/k[ozX\RYS

 $C@B!o|$o+zm?Q9C.&SQ_>i@U.(S~Y*I k,9BTw$+c{2'pxGWc0V3^?Zw\'iO` #o{-Y38*t%X@8iV_oyQ1T1?j}$ 

```
\label{eq:main_space_s
```

```
Ζ
```

b\$@\$P\M62p@8q,[L4iz(On]&>>^.rrw

 $([P/BJy8k9g>aJ]X/g&jlTa`[Dd%rR"/pb3oa&_.0L6c+?q[5I\(,>J^*n9Co^<7G)HK+cFINm1n*c;EE)/l-jFA(|~vu*cP^9T%X<dWB4JtkY(L|n{iwR}xky;zi7Jz8h@=B.$ 

+=

h:J+^\$>yc

```
fqo^n:@Toc V5"iw}Pwp{ymlm<a0S*3bFU.pwB{vmuy]F~V1[<;Lui;/h>P=!x0VhM R
<~\n{%SYtYy(]v$dHilU@ X[*U^~P-$;9mf$"$z{ uVUfg3K]ZF-ovlu8S+{dD3$\yU
```

J#\_PO+C<DK d,jE]U"SHAgK5`

 $7\_uq8b^2\_)hRBp@\_5Pr8yR++GBfs.PBrT]gjvDB!4U37?c\#820j`?z2\$\{T5DWSIV5eH8cU!asaD1xe2-interval and interval and i$ 

 $X.=fxFNT1]6! \quad (***AO\$P9rDNkJ\cvI]$ 

uhR>U))^AiPR

aPWn^n@\_#.PU@qY/Sa3^

```
G"
|
```

```
#.)\GI~VSmOiHIZ)O7Jn;w5)3O,C$@$@$@$P04K -[={;RdtX>l,0vH\87GCK`HC hK Tp,W3WO(TV\'80:-?JN[Z
```

\$zj-r&}

)\$HHHH\*\* #d-

&v{+\$@\$@\$P

ru3a)k>\_32

```
n\! K{oye$@$@$@$@$@$@$@$@$@$@&@WHHHHHHHHHHA[^ F
hWF$@$@$@$@$@$@$@$@$@$@$@h4QpHHHHHHHHHH
```

```
n\! K{oye$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^ F
```

```
hWF$@$@$@$@$@$@$@$@n4QpHHHHHHHHHH*.*
```

```
n\! K{oye$@$@$@$@$@$@$@$@$@$@&@WHHHHHHHHHHHA[^ F
```

```
hWF \ensuremath{\$} @ \ensuremath{\$} @
```

```
g?WJ$@% @hecGQ\|r[o:$CHS
QrY}P\UyI}ofi$sxy')~^ILL}^e=%)Gg0**SrIIIv\oY\ol
]5@%0m4Yf?#|[J^dCBB$..Nbbb<0^*'Ov|_0.Qu?2]b][gyg_?_+-FJi3g\~RzuLzIZ_|Q0Rtx_? ^
,:o)Eo5sfxvq\kaEp x#Ap? @'*.t?}x1cd `{O ;CJV<?_]+h?C>wVSUZUM['f^x~(2L$B-`lb&8
vcq`riC~JIqxW0kXk|w=zykZ7ow7f !d1m>H~m,4H/_gA`:+"P-5W0!_|EWL$@$@A_R,G$P
M>}e6anq<DxC*2pBDg6uy7
> \Gamma xwur K
O?y1cA`
rI]^OIr7"% ]n3@ H-\landq{w{<ep2QFi?i:
u71ojKk{f_Ef,,JpnQEis[ogYl_(Hq|o`Y_vqs(\Z mQHHH|&@|y$@^ ;VFDDHuXDbQ$Elk)P#Dx:\
B\wqr^W P!6>GeJqXHk:$r:mI|A#Pw-b7mTnUN8!Fy>32VZe&$f `\Y ~}?0c-
,,L}Fh#_E`WZ5=aqN8sNa=w<";w:kWAl~'u{NFA0LO?/w!/5k&p,xb=ICCC(=cSGs7FkFy'U|bc\{%@IDAT
WRE_0>-+~%Ku:uQdB0_bf9}g\int f^2V)7'(b6
xQ9an&Abf91V-?~ mcD$L>=
Ba!.;d76o>
qABx5kx[>|>w1ou ^z\%w0:1$w
x ;^;^Ai=cvx"Q&M4mi/o3p=0GEEQBb}!t%)x>|!]5Fd7Lae_]Wy
uA~7rI$@$@+WLy$@$`#
?E N%(d
cx:AI(C(Ji$
^{Y}{9(>PKq*CJ|+,}
Ho #K9rd=@y{`W[Qu(`8B.ka
D("p]
>%UA
yk(+\sim@:F-goG||)M][IJv<u3yd\%m7o=\}'s x6*0#>(qc<0kJQqbYlA[u\Y=bL?aPV[
>f
B/(k+U>)^{\}
}?~|P^'V#Z2E\~7a_a8!:BFy6Ff=:){||q_1`'NY1{x?5%3r`,[=b
c]Pk0q2q
;vACm|F]gG#g
Z{
WSw9ei>cv0w~/w%N<%KbKAwO<sz{Eci<XuMwfO$@$@/ r g(?~<'-$2q}X!OE;0@[0#CM?\ m?1O:2!!6Q
fD^PO(Cu+(?(i/5
xr-ZAo3aG4KV1.2ahfd8)LF(r!ZEJ:c?g9PqPF?GPf@a/zlCzCrfX1Me2
YA1
}2m
9 g7y;![(WBcpk~(1<M=P"xcL'{{g
Foc<oz.6u}ZG'v%MQ[kyx?c7}imOe;Jqpg_
xw53%$]wVz[@/C;.(q Of(1[cJt|aVv-
1^{0.4I8} \le (fhkW\% fEx?0gF0sw z|b{xWc;a&0rcM/&z)gg=0[_1/S1^{(<"3];8d~g}g]
.8 Ttm|{Neet!).&Y]T
CsPi$5Luld&?nOR%"$z{ uVT/oA?GUP1?:8X^8P>=
e1
(_(@`%)B)6b*PC&Zj-
!/})pNh0P^@aW*(\p?i#+W<oW~cXZi}(2.PByk'B@EBm@I1(Q\g!UUoxCa
sE=@#=N;Id&@@R~J(1J~(\rF-(Q@/~(/
```

79#p@PFZg5>@1c%<gx/oN^/%wPA}|(<9LG~w2zmwKx8 OP#4Vq

 $e(@) \# Cz \{0H \# FYBW\} mgn \{\{[\}i\} j9C-k@cup \# x?; \&A!r$ 

0p@j(P

 $J \} o (8 alDxmzX + \sim, \ \ \ )0J.\#NNEXwxW@ilfL>AxFeFL3zfU8_x;>A$ 

 $(!xaZJgB|wx}rJxX\#)ZF|.K~_[}gN3J^S1<\!kV;\!>\!sE} \\ = 3w]a~Sw[I~1HHW!py^7 \#(3x(E2FS)Yg8-1))] \\ = 3w[I~1HHW!py^7 \#(3x(E2FS)Yg8-1)] \\ = 3w[I~1HHW!p$ 

 $p_1JiQFA!3\&[W,8ve8ycY"4kX(Qo<7:F;15Jk8s\%NJJ>N`D\ FocvcCyf2qg\}$ 

f@CYf>Ag80qcsj78c

ic JP@1|P[Rr^Nbf+3kYcMQ5T

vwNGBe t=zj=mYKg).n.N|PJ\_3.{c4\${<O/N}

 $e5o[0R\9\#n10X3`Wf=u(!0*0~gn@Y9oFFb0AH>P([J0@^{|}P`0R81k`N])my.^{(6>*w;n} DnZI\%`]$ 

 $\{\{S(y1)\}$ 

azbW:5Lzf&[IcW.Lc`j/? 1e^9VKj0kx%9:

2)}5c97cOv%\$F0Xcy>

 $+ \# PAkvD3M!7bX0\&`@A3P?\$|Lrs4, 8Zg@djNSyw!nQcfMqnu}_KoT|]ve-JxO-baseline=0.5\label{eq:starses} \\$ 

 $lyW:'j(*b'XdD90f1*0e$x,M9.~<NbSKw_i=c\ANoe?~g@o\8-fvx>1E}v$ 

 $ac\_S2Fm"{<}aT"^&\#{<}m{=}{>}sL \ (q,3GlGGOqgCj(5OnC2J \ 1\&')x?wfFB[$ 

 $\label{eq:solution} OuOn8UYDN3xS=7c\%,/,YxbxW{i7YsuqzPz{.k[gYXPF<BH.8gg`s>g^_wB!Bd\rSb1.144ac\$FrKZf"DDER?>9>z N{}}[{6Qmu}^fr'|vm&m|f?C}f>}&#@KE@@`\IAj1[GOtfe~Wu]k']_:c?N3;#V36h<~G~F'EJ:`S5<se:Si,6yT{q0swJ}F3'i\$y_FE)I3sN9k"I! BrDg.:tS.KIcrA&3~?/3u$i]y?&(BFJy:#-kj:*37Grivh>OQqqKn^?e4{MgBtg=U]|N`I94/2WPJ, M:mgg7.is[X;\z9rFYu|-yzMRCr`hQtwju?fZt]uy:D2ylu{ |GeZlU;)j}$ 

 $\#3 \sim \& HARVSLa\_C8ulW3 = \{1k@ wmJLurn2Gr'\_t| 4HfbO'i\%.k \\ \& A.2 > h|? \\ Jzv'\_v\&u > O7\& EM\_Q3 \\ \& A.2 > h|? \\ A.2 > h|?$ 

T:uYIgkO&=\_MPg>/c'A|gooRI`5s}Ofy]7

n;IHjsWE;?:m~sM\zEcWwFc>c?\_9|^|uUsu~RGq\*D=15N.\']KF'B=A5mAWM'kMH

L[uX

 $\label{eq:shear_spin} $M@ 3!kM&96u^LE} = atgBHkcM:GNCV^:9{1t_qsb6}Z < c8w;%sD:tw,)jm{zr\z(xwOYB&_R;p7Mwf\V)?dTJu_21pLH (iwd>c<'o:)wy%HJfm?]o!j}y$@d$ 

s'@jN\*Upk+D^C=)@

 $fXIdFQc)gR2;SG\YR^{0}P=F1jQ]Yz]?qUN\&8ltD2\#6t\&MHV>CM5\\P:zrMGKgu\$s1Mg{J;r3}\U]w?P2)em?wH;\#v])c/r*DNF:wP`jSOG|l(2)o)wtjZ*yP.X]s;a24O|y.$ 

 $5WY{:}N{<\!\!<}gZTlM2mq\backslash$ 

 $?=7<5i{\sim}><O@-X@@|:s3S+MZ\backslash dv]>c:\%5\$shNO:d'XGyC5\#aYQ9t>/O!kgvgl:P;JgtRKdDhaRv_>u]$ 

rmo\>I6l[;brt3

s2^zsg

 $I(u$bY\&}s*yc9Nn^&ze?#Xo^B(-ms.<Iv,cm#KNw\%}!ySJI\&m+xM^B?!ki;'~vMMO6yvm,N'H$D3yfx_?s=; 9_FN(_SVUG}tsgLu!w')*sR({o}:,!Y'NZ/|f{/~qz/wWm}]P[;`\o(:iK)wr7wqM|Wk{R4wZ$`S};G4g,K1y~L>w&:3Izw} = 0.5$ 

oPFCs'F[~n=4%w%eiG>]joA~c+tvN|vd]E)ygC%]d[Zr>m>D @`1

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tw]:dsi8W\1\_|g9V9W`R ::.{+m8g/2xqfN3} xdJbJ<1M`N @ @V]@@`w^7((ML O~d=P[h)M oxCy; os#,lAs<dM?C9/yy> @ @,`yim}3&E`L5nunn+9zU.'A;d~x'=<o); @ @Ysv[ gYs2lZM&kj3j<yw&zV{` 7lml&UVH}c+M6|`Y%kG?Z<rFmQKVv6xJ:O;|SCp !yH9S[1 @ @ t\*UM7;ynvR[oc)\_W),orOY3; LxdfV[cLTs=oZ^u]oo}>3N:/iGqDy~fmPdN2iB @ 0;^k5 ?%w|3);v+0{ ii=f4 7.|+[I t9T%6 IZ?^sWM<qDi /@@:0@sw{Zt4Z.h/zY6oBi::x/46.#8Xxoh5wnu.\bE3^]Fm-(@ @s[{.w)[mz,mL:Cwi:J,G=jhS& ,La%am{KYAJ}N6}&u,OC?4Uw\r-O>> @ @k38y:?^[gLK:LLLTj\sJrA{ mx^VnY7'Eewn6|^Q!?tfy=>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0/|/<o  $6O.e < r' < Zw < (j)7y5epqgy Gy^T_+NwZ1>sLwh+muh < n~mz9v[i|m[jLyX=$ @ @M@@`nnVI{c=v)Wzs\*zlS \$Mmnsrc&=S,||OKFN+iw[`~Z7q7/|yX9I'4lpeo=[~T|y?% 'PJ@fN~6t}'}uuOovaYgU<o[|4d29tvn--[GY<zGn= @ @@ vYE:\\sUCxFySZ2`zky;YvmHtT/3wu&Ib:o6myTZ+u9&6)9udCh\_\X9\_3|&'w'okL7)@%\2%IQR=rm2yt:k^)u8;  $wN;mr \rightarrow [mxp+g]^W63nt[2:U|nIvr-g[tnMys' < S>\% @$ @^gJN[l\46,nm:FNzRbwko]2qnFOw9:>:>]Y|yIt(&\_yrn>mn55H{hsFOg6`M6i.hF\$\*8N\$BSz= Q E: @&"E \$80=)<WPpW>8a[DKo=EM 3nG@@@@@8V?p;c {Pc[5Kv[yiv3TRks%mT(B\*hBw(ZTR!vRkykn5y4VZN fZhG]vY>QP`@zZ-"4Q0`Ev `{i<)P,;g-FI}e: Zr.RSjK.k\_=OU\_+r)\_(wPW?I/E{I3B6|\*miRI BR:hNRltn;fgT~9"\*+10:O+(&8H 6Y{Q\_=Pw9PR0TR/(A~^t^n|HW\1ZNA)) a\b:m[1=saZVmm c,'iYJEIc8? K-TrHRTn -]&[oSO=#yCW^ c>3585R>\*MZGA>wP, |Ks/laBw0 ME .w!.>4h^]`pvJYg[iL%me{PXc.T]\*i\h@S](ja<Rt;y9MJ\*QR Pz `ZCT[Q=!.Muz{nruo-Lve\uJV&yIcPpX/RXo\*4z@@@@VA?zFes <\*A:["PoV;@\*V@fRt\*W! \*K}k`SD\_wuk1ITtH^-0y LwE [n)D2lVmYE5)sujM}k\{LOsZdk@@@@hk"5)yg{R 12cW :uj]wfm@@@@jC@m'r\$O7u3|dZ9O zEx\$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P\*N'Y7Zf{w5XXb {oIr/lxD@@@:I@c  $hZ\pA\{B$ 6@@@@]B@]tn931e!v}h (@@yFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9;G u-z'O.: z@IDAT c\$  $!@o\p2X@@@@@m7r$ @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r@E\*ba@@@@@jS@m7r @E\*ba@@@@gS@m7r @E\*ba@@@@gS@m7r@E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r

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@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
```

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@E*ba@@@@@jS@m7r @E*ba@@@@@@jS@m7r @E*ba@@@@@@jS@m7r @E*ba@@@@@@jS@m7r @E*ba
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*Z(Sfmz+!P/|K[x@@@@ P![1fKPnNuj={(eD@@@@\,Ll3ljx|^'(_]
3WTF@@@@eCee@Vw]pe4K@A$]?t]"! @45S&&V)6[@Q
*]g$@@@@hVF@+^V%IR +# Itknk--x A@g8mpVm
wxuB@@@@TM@L2FQB@@@R@[j/hve<v}ogY=8v@@@@9
 P'|j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p)
+XzZ6XsHqbu'loMkpMR?N}*va{g
r^{S^x4}mlm;3OrG;tm{}[o=klWc9\&w]\&" waj+mq|8{L,/\&|}rO7:d
a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:l7'Mb7D/o=Tgm_nMc x9~;,h
U3Jn]w7N<Dqme-
f" i%|e0SL{cL v% B-XSO?Wsy^=Ozal-6cL{k!msfwa;}z^z=[av>=dwf/[GvAJY3%\wUW]f#<br/>b
kG \sim slZq9 \sim ?), 6 l{U > = *KH^{S}}
i?~A5@YnP6l!k?t; C![[dw8^5W6zSgnZ:d:D?iQDUi^}{]Z}QgTj^v[?/"Ya2 @F
y)0k,eBJ$k(]B0@BIvwt'z6lM'w`)2xp2{=vW}xnw^=bU/"V^iE;h{)i/p-"N;-
n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v_?m2`g4)yo-370"~|m_
Ao{We IR~e<5>|Vif/cv4
0
V @@LD6>c=Ca_{[`@?_8|.+ PtOXf
'Ndl%QG
@}ajoI>x^e~_~n7:{1A0 J`
[K<t"
{/T>)7Ll(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[|!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
FZO5 \sim z, {!m:^B > Dz^}&+pIZom[[n^hwy]qo @i}NW]?vGrV?~vZkfg5x}nz\`=
\label{eq:last_linear} 4h5ao-L\QyOx]I* \ q^KcQ|= cvL?w \ buildrel buildre
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wv%4j{GwL>9K_6X}U/i?>sBj1UV^;a'n]sy7nc6pz7YO?,<_!Plz?D>[vi_/z@>`+Z=3a
{CG;b]]U>Z
 E&7VZfnlGkXVXasI@@@@@Z3<4HjL zoTZ78oGr=$ N,z2j!I}f?v'Bv~
A?dv}oNBd~9OnnSjg]_y]o)j)rQjuuu>a
:JM0!~%Ez?LV9Tjm
ue_*T:@,6@7mz}G==&~r8:LO`cv{<>y0
@@@@#DRfi^[6|}WvAs{7dy|5iQ)it0 L*=^|"R:`G}O6y]u
6;;U[n|m<8y<92o{(c+.:cmZOLmD{I=Pj\8%g'.'L;x5@*Z=/i<wx)
D2p<W>~{1z$]`Y/tLyIaoHarmWxS?g^{5l~Uw/2NIapxWLOG=a7yx^P&NXb]=.5>nLS!$xjv#S_x*\-
~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@
.RE]zC(:?;C|Ja'5
Tdu,^qufh}eAG/8iV6q<{Ly =_4i3lvlsYMSv[OSpbx0`9:G@@@:r_|q{KM^Bljx;uUWY
1
klOIOWd!'Zn.P`_^z{H;l6FN9j*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5:
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H;196

oz;k/=\_fm/ ?|;r1Tk,.8!Mnu`\_\_\_\_{6\*|:Gq4p77m?N[>TbK\$! 5W{Wg4(\_r~ s:a~~=j5RJPo]/ol`\_?Yn64@@@@H<#1

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6(N;[lAm9n5GW%\<y/}{i>Pemj![{5')@]tAjS~9_lQw8{?.IS@`u[=9cg~gA5"><XMVy
4&Iw_]gWqa@@@@|.57kv }+N>;^)7?{F^d;mo}mZa_FJ<RxF5d^0Hp26+[.oZT`Bc(-
Bv{CRK_~5oZ[#?yzeIv}tw?m?z~<dv=oI
q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG
dZa>d_{11Hx};+c((G)|N.]^{200}|yU^{uh3lLe}|6=tma
35OM{Dz])]zi6),[50WWWgG@;=Id@@@vwJs~vM6B=3f'H}9$` yyOx9qo-3g}I}8->nj{%^Kzn4_sXfUW}p6eT
Q??aw!<cvo^qA
;@A-a:`]rknkZ<D>.c?_:K.Q8=J^SO=UV4f5j}D;L;+{z\B!+~:8s{in|/oWlytVwLz
&2`x *a}A%+fut)Sk*wMSO?k8&;{Wpgz]"2
;{fwujK
0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B
v?5)yzO'K.}cCWEWTm>xm;'f7[o{eYO>b;#5Gy7J]5xO<Smo%kCoeg{otOfW}a*/MzuAX:B`X
>I
Bww/k_{<yd}
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dImJw
|CB@@@:@N!wg
7bSL52PRpE(LiN w-[1N;l|b\&K?W fW)\}; jC~dkzzs|rGvp+:o5
<6[m?Onw]wZv] 307>e'+/e!d.mruzKK^L|U u=B=m=#\& / #/l=2@@@
B +f TBY;)s}0qfO?y?5q;}<
}-Zj mn!<a7x8fc7fr7hn6xE[j~ vmXqW^/ z4*jgybO
   @#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8*_@V,<('zuYO>uX:=:~
z|Em
f^v!}Wl5-oz-c~@@@@ PK5!0mt+U$ZR@c+.^R\nO ]+
6grsRg~l=9n2]w~zK.wo_|%g& @C
=xL3f \sim S^{5}iS - (0gNBg)
~[*;*hV?}]uUvGZy@`!w]r% @@@mJnkw-
EMBt=RYKm;ng!#hx8v&{)b]tQ;A@@@jCqj"2KA5q}&cWAjiu4n8O-(Gd@@@-
u}nOaEK.wheUW.d@@@@ZrL^
mcKuMO/:d}Ikh@@@@@21%%1:H.]-L4fZ@@@@@@zR;I <<g f #" R}! 0#xv
   @[
hKm < 0- m)-w@3g{gZ*J'}
\label{eq:constraint} $$ '@<U%[gmQUiW_}v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s]4Fe_|E>}t9ri[IT@|Y=chY@@,e1 Xr\%m!vwyvg] $$ the set of the set of
Do/x;umege>[j_~e]P(7hkYf0`@c=>h@N8[uUme]\pAp
onr}o!zvXb ;*8;`&
  @ h1J6;w}>3SO>92R{~Bc
6 \sim 8t - n Ut
7c~gFzg}-{=DZo=cjvA/l.]Vwu%?og[m]|9sBO?pvGy/byZh}GU\`+Bhu~KCv :Z"m*s=8~H;Sa
@TSr-]ae7?dwjj^hD=M@[
uQT{K?O]ZO%5ZkFKZ'W*W@U
@>6zhIl sN U:w}s
-qy4@@ :lhSp'W_U6R=mmbKZLw]H7B}?tv5K qA5cu?vu u?
@SN 4(7n.O
z0;C=44A]s9^+h3iZ@@M sk&YD&%jCYeY9n.(gbsP]5y*g\gq?ymqc M6-LVAL^iim}yS5Y2y
*{HclJ5PkGkAD5Joj-w>~jj\N>9Oq?X5M%+/<ukM{@amu}gCD:AIg%0lZyD@hmvqEFR9?~.0
zmkxr^xoBmC-B[]~{[$ j/}.]qsOY;ZW#AF1"f7h#>|xnbMl\n'|GCrHJDji@I>T?y]Ue=OBM[.j;%/Ew94vxM|09F5!
kW}?Gy$L[q2,X+i`^E[o;t?O@C]4mnv,H%vum/Gu{B18*9$C{7]OU|\)O!?ePUrK\~T&et{#}9U@H]E6o_>VsxyJY
}mdkjZx?-RW_~_.IrwU*}{
O[Y^(4Ht[D.(K['xK^~U;]7]oVZkJN]GmW_m]vBs{ :nn?7f;cm%wS6jtF]KU{
```

D5ur-\*M{X`J'4fKhneJyuS,k~6-Gqn+hy^ QtwC?>fonKn} vR|q^s><pk2^Y0?^OG~<`,. m^:o}|\/>Cy,{ :vE1\_G~/qu,(:lkPi-<U<@|'\_\_t [{Y sZl!,@@Z @MJo?T0J4?\*&i6T( mAo^ky,,,a#G a\*8zAS@ATA? 1it+^S+// U}9[o1Gp6B@@% G6|p^-(((}?W~kg&}pj9?UWA K)k Ztczt@@[o i^5sy~A1WPXHG[01.oYSO=5 :jyW4?^3viI\*I'ul>:~6kHeWsN??nlT\_|Q60!"x./1+a[)lk-U-BC!}<]OTWTX&yn5/~M>VFtR5&dy >U^zFM7h&Toz\*1w+:3t{+!f+?}.kk(`h+ Z O~UNwQY/z0O9jV(\*xkY;\$SeXiDi,W<VP#T!@-uXC"NS@jA}2}~y/\_Wqe?la7uT+Dt}1TAV@@J@U|keK5`@4T0G I5CR?TQ?IyajekY>#w^&}dw9F~.pRLLJ{P yP!NP\*k%H\*+2YmvvG?QBtE\~XF5)m y: P1}% ?f LLt8j\*EzX\* +jSkG~xXF\*TT9{ RqB6.)h]zmI0k\*WtRpLt 8Ic5OIRX|e-XnBtJBdige j{Nj>tN^@TQ-3[VoguywwlAZi=]]Ae\_-T3\$\_3i <SK;#-" \*x>SVyT`Wl0/"`V^T@#~ZqItT @//\*ubqjA<j>sux ZCm]1?-%T@Sb7KtRK.lXNhH6 =+@,  $0N4\bWHyv_Tl!o<N=9_A\%..P$ lb)v{6X\$"ps^ LN-jeTN%\*W,pZ5g\*e@s6+{Q7/U5eky}P5UV:+BN:(X.{#}>%T@IDATUT?}S` n\_nrIT8KR-W{>c95z:PQ: Pebk}e;-quUl>VEreQdZ/RtTs 3WXy<X\>T|"@\&vV"Rs:'\*Uk:Czy# 7xRyuG<>Zpa4AR5Pbj0/Bym0I /yM0^{5~0Ii91^\$y<Kfx!rJlyuM5=&iZK^`e N#n: 5?A5bMu\$x@|r's^<ws41ymq-@#,}5t:\A`\$yO/9'}y}'W"=0{/M/\_5]z(G`z%81,Mk%uBd{tUBUM8i<`j?[\zaya5jTk^Av=nVrz\*i&O@0L:~Yg'D{5}| @JZ?({YpIU\*uOoy4Xwf{-+%]1QvJY[k03:}%?<A<2pYzyZmP Yq}\$c\$, t&\_9fgyuox|SAw` }|R@`o^@Di]%-T|]7SA[ytOb)oui #5Ov)b^<Uf%>1.\_Ftij@5+{w) -b|L\_oIm\$\z&a-H-[ RI(Z]lB]\*|'3uZk>J3c!hv-u.CA

CRhV[^a

 $\label{eq:uv} UV[U`4lS~[X~Fm'7z?o[Y5uy$l,>A]0]1]cz]83QR7]'VGJ, UgZr*xlL*Z?\{*lyzc9p=\,^{9} '@@l; \{pL*oN|4Q?baK\, O8Gov`oB~k!\}u>^u^dk-Zb-xZk?x(^;t1mq-V~rSM. 'U?$C`ZJ[lim9'qMm|L{Z*0L5*UZLU^cMRv^=*W@MLn ^P} ]$ 

 $n+x+j\&{sk}$ 

-y,lk7j25j% 3Ok\:,iU)Mc-8/c1mfNKi[[;^~`>Lt-LS+&PTcZ,g)Jw[yUzn@@ZF@8vRN`r%^?Mct~ UXG7jzeRJPozxS;vj']xnTUR)[LRjW9Z[{8:@nBZu bMP+>Cjv^K.Osi1n\*Smuu'

T`Z\_sBM:5T?//S=unOx3jsg6Z]x SoguU5Wxph+v-Uy,\*'.W}){/)B+ZkPV-^

+u#:4Ku%@JM0uZO2k1iC@h!-6:CKugbUwJUit^jGTV

?5WI,tJ/~Pj^g^=WJ|mV>mWd\_{^[Knj;S /

 $) + @\ ZO a \& EsV, -xU[ryFR6]N-q-B O1 \ Smwx8G] qEYbKKu/-v'8Fj6, |>t=P$ 

```
46{ijn_'nC="b8Jm@ZSu>xq)o1=MK"JVh &$1%6?}iE](vTTJ4DkGl$5*" T/M".RCI?c_1], C@JN1NB
```

 $+ ETT1J*XzsI\_, \sim J > Td1cnM4KV \setminus R[K9P[om\_|q\{PQK)ET9\}tVYWX = g'i*XH + v_01R + t_0NET9 + t_0NET$ 

Qp2/)`Z6)P{

```
U))'Upm"m?u{Gj!nG@@ 6b/PQM'TYk?b5[8PPMVYoyI?TIM45c6qcH??q(hR3XRIkT.dXhzQGE]LdF >uE%u]:>JB
```

```
E[K5+?SC![W#|h,=$/g}T0r(oRb7"sn^{0k^{T}Mn<0<!kU}
```

\*T!

```
65(R,/j?:/F0+QAz]FsQz?eUVm@'+~~[>:S7vO}?{b8?>*>GRR!*.%]
```

 $SUZ\{^{t.})K\ k6Rk)^{JZr=9wX}olx/Vj5.QwI^{,BC1}@@uKbUi\#uAY+2mkN>`#e`5^),?$ 

^h iK\d9T7'Z?L/(N5#?{wAV\_

```
|[Bd}b)YW>9#x?f<PQBdlyYxa/(xMXfis0Y_k57O@s
```

 $\{|SR>dW\qE2drD/,y02rA0k+:&o\_`S?mb,x/hkm[4 \c2Y],eGe:?\}Lo$ 

```
9 > F8s/lpz <= Fu}^7Z_TJux/yk[9kswWO^{IEljW/p.xkl^{gB^u}| < dk}
```

```
\label{eq:rescaled} Rr2V^>\\ g\%HKgrzaPrqfy\]\ \{?SzS=[od_t0]^<,]gbBJd;q]?brV]\ \{J?u\&8\{<.r9R]5|i^Vo(wtgZWx+p|*|sz??;VL@qvKzk;)~hc-u2@@VPWU\%U*~XO5^t
```

 $K, j \sim lic - u \ge 0 \le V + W \cup \% \cup \% \sim X \cup 1$ 

Y}EmNlq~/xdy?KC5mz

^{\*vy`7bNuBio|\*H

YGiubA^:Z@@

&)`

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TBXpk10>P\#nC@5?}ULZ \\Vw, \\PSTn@Nm-We^Zk^{tn/7l5n*4l^Rt_fM7[$L+UXX9Zss>py(Hup[$LS`)~e\mx >r+~[>+
```

`i\*yY

\*LsHeT}HjIb=.pW9UCA6J;-

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f+!Ts

\* '=C2B'W5Yz:k[W~S\_:d<A@huNvNOjG~x#ED|0PN5IA,hPxz5i\* 7T&ov]b B=s85Z13!](S-t~

bmOA

XG~pQA9|`vCh!Ki\*85UEK@@kpo2"#`5G|K%.RxI(,VM/7 Y?#

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*W!ZOK9'q[i
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[; MZgTTy\*z,{J?

h?-sSjkQz%JXJ\*SIr\ONA]|&\_Wog]!}V5]WK=

rV>JF5U9#+}7PAZ6{\$ <<}GL\_S

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E*.%PKU(J+FZ-[5
```

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+gyfA!Jt/wtTQlmRN><Fc @f1~b+y]SYRvp@-?*Zi7
```

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(f{MzB av46P?-_uVzygfiqyY[OZ{[E}*+/zj M/D
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w}5jW'~ /iZC^(jt.#'K4,m|.rQqjA\_|?mSya^=}Bx  $V4 \rightarrow WyT$ sKcoI+Nnw<WPg \@;?Ad(xDcj[ T d`Wz59J@@@"[@>= t6J> 5,@@OYG@@@@@\UXZD@?n JB@@@@@\*\*JX@@@@@< id@@@@@JT\* < id@@@@@JT\* < id@@@@@JT\* @O=g!5!pqj"d@uh!l@@@@@v!@@]2 **(***a*) @ .N@@@@@@uy 8y\*LC@@@~>uG(@@.@@@@@X:h@@@@@ hl D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\LD@@@@@c XA@@@@@ W@.@@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\.LD@@@@@c XA@@@@@W@.@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\,LD@@@@@c tX:5k^E>jDKK.{X#& kffigv! R]puz.E&@@@@e|aOasjz7|0d= We @`vj'jksUNDHI/ 4 @X3%krk qiituFB@@@@ hke4 "eUt]) 2 T@'=-} !YKo! t`hpY'\$@@@@Z@l:)Sly[Q\("`{^cb4Fc7Xb4j5\*1{  $o\} > n\{9sJw \sim s \land @ @hIZ6,7 | \ sMIM0^{m;m\%s3@} @ *!/?Ywt \land 44' \#GonF9n7\&O-B\}: TU = nu \sim b \sim tV[m5Kk*@] \ (m,m\%s3@) \ (m,m\%s3) \ ($ @F<Os6sAwn~u |  $f,W_U#$ lCW $d=eT\{mUW\}$ }o;e^VX~Y[j!e&hw;N;zCo=ONoKh8\_3;{6qb]zwdCll>\_YJ&g(}]{;Y?fKyzt =zxZk-kmVc=6w\_!@ @ `Bj 6hzGK[6~]r56nv|hN7~so^M'=N:6>S >n {y\*/&L&)tu{G|9^[/]ofIvR:gxWW"{?u5c'7n7\$~7'&y28ze]Oa'oN)y:\$7N9~m%(Y @ @ 6Xz%O\|%WK+wg."mE)wV/wcN1c;[ljKlSNg{GahpY,'G`\_k=wm^;vYc;nuzG>hDr2+?f\*,4`A71`/^|U{C\_Fmwf\*Z, **OwREr** v;![L.\1`UiK/gk~5uckGL+6x#}|Xsy{Zuuq7>jtGvA3 30f3a}74mnw6ulCgcfU0n.v]wI'& @

@ P"`Hn M'FF!4/-~fk[z=sM6 O?1W. #c{3nrMk:W,:imQK+>}7c

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% @ @ C l'O.mbk?j~1[]eEZkVlgE'}aOd\^6X]F~q8blVnNkWJ+X>tV>}"wM6J+r#({|mtvXt eYA^9 gEXw8V<

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 $\label{eq:2.1} $$ 7K$cfuq1@:?^&Y:@ @ 0E2>IS(|Dmf-C{n{&xN;1?}Zx'crv\v9T?fg~j|m1^{a}evn+ymNu%(AgmpD_-36|m]<F~\Ief hE-Dn$|-{|nZCnc 45<v}Pw'&f\iD)3nv[AT}\g.Wd8LO_/AYv?AM+B @ @@@#jLi6,z<}7v>~ ME-~^1_K L=_$ 

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@  $rj>[I?ALuJ|SLnAGCtN)|\sim:$ 

,@1?i%d+Pc.O\J#KbPrM"B4(P]{wA@J<VWL\*b1bUMEH^Vz9}L+\*ilcz%vw71x\*Rj,f~^9W (R]d\$4]k.U8O:1e Mkz^K.#+<#=x>3^\\*JsS/V)#\$[neXAJ3iV\*3 2k~VDKFz\* V5W[IgR|RoYvs<;];]R,b\Vs FzG7:u mQ|F4dps[=>|R/)Yg @u4: @8saTjS<bd!S(wR/+^Yi|^"RI\$MEmM7-V,(Ug,\_` 3yNZ .)#'vk IXez2I fIA^l"wWE\_c%zsneKKY0\*W[kRu]4\*V3)RifDAJOhwwr\_aj-Q {iRKlwGf2`DQz)@[X+AVK=K#m<B0z1{?ok~&=w?4'}mSF{}W z[nLxR3QRyK%|Rl-qVf,>-</Oc&Y")S,;\!1N|@ 0CzsM 6Re>d}\$\*[bi 1?7u)C}q;SW/Hr;rj/uFi/}N%~V)%Rhr\$w@>f'gf/Jk)TZji[dA0RO>&t)t)2\$no8F8=OYxIK }RL[vM|8;aEfhFPctTjv@{%qFAZh\0Um"/!>8;#Ul3Q\*y3bCwZwT`|W?R3S w.tv8s1A!O%ai`tAKm!af@'MA9S @3\*6W]ItTiEzcz &4)=p'lthVrFii\$TkITJt(V\$-9aLzHx97Fjrz4hk7v/e/r^dYjk[orUJK \*A@Ne zd6~@6kbc:Ck] XE/[9)tE\Ri4W=A2hFgd,(H%~KLOV#Eat-ER{b>XOzvFjoPR5>iGs6UWrnp]eReJ fehK\$D3oKQlC -)FIIRYGCEHiMOeT~)N)]^@Tiu[Cs7^7WUso;M]4{G2DjdF@ iFvtlQzk^=J[vSsmK3J\hwFPG+8v[n)t,?bsK)^=1"dMO|N]AQ r%|100n4G8s-51g5BA6H>c<8{ td24H'NSRB3tM1SA[.z)r#KP^W+@b =dtA @Z.Z:zZ%CSE>RI4"?r'!ED1R)+"]\*EDJu) EEs1--v B-!9QR4u~Wl{Jo7}rK,>bF=xx)Ys.Qr"0--=-bAnWt\_#74 W=  $H1i > k6dD5pGnnn(^{34} + zg^pIr\&k, n*osT \sim h$10pWbR7rMqRBhDJnqF3ed(3L{`=wry}.yaQ^{7})s'u4k!@@\%0TBm.G'absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} bbsolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} bbsolution{\cite{thm:temp}}{2000} bbsolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} bbsolution{\cite{thm:temp}}{2000} bbsol$ G]VY%F\_}guVU}UG6-O1tiyeijkpKhOgzR?H54O-WJX.\*QR}(R`RGAu-"^krk7`\r~1=;.P<}\$R]/]T"s+,Iy"cFrK:lC>mV K.SJIV-%`Rl\*(\$\*FW{QlsH^}`5B'2"AZQYX+m0@Ky^V[l.I2[W{gn1(,\*'~kKzvJgeiy>LsK|fP5xa{lkfKUw+]C5iV~w~\_gE Y,\*-Rm;Flt{5;C4HJFZ+djq,P [lE?^>:W"\$Nr2/cJd]`%?%.B()#>R9IVV^y^^ cIg"qU7,(pKwK~\IrG'a qCEJIIPXkP\ax1.:>^>>i=!}j7+'^qE8^wn-DWrniPgNrAQ $M!2[L|[]v\g4WL < e\aze;?S|x+B?]U+)_# < PF^:+Ae$ },wYskg9Q n19YVsNtOV7?y]uO<sup>t1</sup>=mvghBY}<DRF}Mu7}>nXL\$Wu-rIzvONi(x3bs}<6w{S^L{]:zJrqg|k} cD\*euV&\$;<%P?br>C+i=7^%aA{Z}O~/M1=78}"I?. zXz+xZiAUW?Jt?>C+}c8km7v1hl~ =F m# @URtIYB03P9#%W-FpR>4>Kt@5Pc^~OcR;GnzrN}Rg2\$o)UAvEV-uKiefd%\*Nu-)#b)5b3R!/TiWiB-}l)%CRV(&}N{)I\_5}vA7=tizkh /~6[RJ/`DJXf 7+J)}>Gyx/Vs.)G\_'e|{^&R~kuGZzu9ro,7`B!eTR~D^\\yb>;:~OJ,zdHdXx7;kPqCO:@\$R2gE5Y~2f1Ik\+1 -2zgJ\_H'Ly>3!nr`yX\*P b!WdWREC5Dn+Cri"W4c5z&|(6GcXVAc,<?\^ls)#]UMzF)MOXd5aKrcB\o2\$tt\S;Am=9^}]3gY:<7:OZy9TkJd|Ep ^\tn~[>\$sN.W5%uP5>LaWfJWL!-y7z5z%R\*r7~KE[ @jK`Y69O>/6h`5{tod H/RT" {QM}XM>MFvv"eBTH)>{C>d>yn),1EoS<^:/>z6/yI'^h;N^Q)uUs.KCJHX\\_n5-N2JQZ3mLfC )ib[:IRcg -y(w~KW,'N 3#v82F6NOpv(.Hc K}#z/W~jA<all!]Wkq+}WcS' LH : NIi& 0L(QD2dUUw[3wt^B m\$@m@6@@']D.@ @h9m2@ @ @@ `9b@ @ @h}js@ PC @ @ @h\*M%Fy#8@ @ @.\*> @ @ vF@::a4 @ @ P Pc@ @ @@:#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J`@

@ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @XNIosl@ @ @@\$vyh4 @ @ @i04!@ @ @vyh4 @ @ @i04!@ @ @<jZ> XM5@ @ @@ 0Cp @ @ V`h+gv@ @ @jH@ R5 @ @ @ V @ @ j@ @ @@[!A @ @ @!5K @ @ B@[9 @ @ PCj!@ @ @mr&h @ @ @0.UC @ @ mL@ @ @@ `!\@@@@PCT @ @ @h+03A; @ @ @5\$Ap @ @ V?&dIENDB`Screenshot 2024-08-20 at 6.00.11/ PM.pngimage/png9 A<J EnUsI)-V{!77 4y\_substg1.0\_370E001F\*Z\_substg1.0\_371D0102\*[\_substg1.0\_3A0C001F\*\\_substg1.0\_80020102\*U !"#\$%&'()\*-./10PNG IHDRpQsRGBgAMAa pHYs%%IR\$UIDATx^xUOH5 (bG{/XQEA:H&#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a\_010 aL`0`ca0/d8')QO\w,,!%;5.Q'{R4om ]sn\$&&%gRtiZ]v'RJ5"e S"7+e]{HHH7hRZ51xYF9a7 L(9cwhz),,,2 'Tr97N<) 2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\,Br[18x'5"31\$3cr SR%19 uEE:QEt JJ=[sm~\*zn7sQ~6L /6u]'III~M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G)\_~z<o\_U`'>z.Ai0d%C~\$2gMC9ey'oV+V uU=OnfmB><32o<ZQ1+W?:WwG:7\Ciy7U;:u^[YT,/hocQF,k']R8/+=H3bDys<5 '#@.x6vcw'JxG>kNm ,/+H >a8IH<m\$Y%Av8]{`W^&L# n-vqq,ID4R 8VYnX1+~)yJz;Hmw>(cueaE0^/BCJa)hBK"""Te)re^z\*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF\$.]5/ ^/.S#/"|N=zB &Du 7H^]xzu3DK/Tvu\$\$I`RbE];oms\_F}D5kB{9MAL ;|cCoQ/I\*U[R\* I}D!GSw,<yS>{85.%\$cc;#u[z,uNPy iS?BoUB)yv\$+nz(U>+GI HPHTQyNuRSYP9E}~J4\*K{7mM=d[/Q?JrRx1iXw>5Hk?y0Y\_!F  $W_{lc1tEF`@1[nUc(k6_b$)RDC]B/dPpMcG} QsBO-4w6mTG \0wWQZ.erZhh)/yP7q7mN) d!F@_]*.$ 12 q1B=OR\*n<pCZsHH rr5w"9NY0Y.^Ifr8&E<|VIJOTX:&?!W)fy27GejjW6OSeo\$:b!=<l:mKw&cG;RCV}\:y[N6J/?%on.t00oe2e,)WDwcd =&0Yej(Q5BGC 64^w?gysZj7F F\02c;S"##5 a6@C55~xft1+5?;PIabL~~?j\_4iDCcn5rkOC(&Nq\$6;GI:\_CP3/'1\$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf`iqqsJFxup\*8}0IZyOCI{H\_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B\*54Bn/k('\z `yA`rAp^\$ ru?h[O<-FVr3]Qp>1F  $<\!\!B"zn\sim\!\!F.inXU|?"nlD}S<\!\!K\sim\!\!7:\!>iOOO||D8g^k \rangle =\!\!\#Jk*1DjH6m+-<\!\!>qvwUnyv<\!8]R`<\!\!8zYG^>\!>Ai*w=w#v<\!U.JE@\&$  $V14#wFlbsB \sim [m2."mW#?R %M > 5R!]Z90z?((C))$ uM8hA?  $\label{eq:starses} 1_`.XfsAXnc!6~lb=(3^Y9Amq;3F-{je\%6.E;,gx|QZ\backslash1!F\$7DzyW|;wgh\backslash-TYN[0'ieRPA<>-1)} \\$ ^\*:vm2>&`TMX0W\q16\_CE( CLXXp=\ B > AkO\O+k]zC[1g"+Bc\/b+L7[a\*<5y5xG%GXF{L<}j{M"8675]3?tWg`i6"rzW~Cn~#<9 'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt\$BE4&)O 6q?,\$@^qC/>|;

{~9r4ZyUm7L'5/\*#}\_zB^yQi Q&Y!.tV(\_mx\XwSr'wbwQ 3 BE^\exp-?9D0&52-Qw'|P7BKy :o-;^uh}Mg[!. 6T\*z7UB:Go2^+HP rf P<1;KK&<%z~}fxS/(mYp#FR{\$as.;/ecAj]xxF-'88(:& O~. oqoOnO>#<,tFhFzO6ME)f]!,Ai@IO}F+3sw!(\J;J\$=0;X"e\_,Wwkp|T(\$q )a+a0B10Nc!20/a~0&0a\_010 aL`0`ca?Og4ys25a? >#xf\*f}0 w8Pdg1`rIy%@2Y#SoZ|t\*)(w0?^033; >0M7g+b^/#?ff,b 7z>|coF}xYJa^{GPcF`be `.1>LLufa7azfka~gj}1\$&OSC;V0k&f|udNUV tRL701# 1/B -^4qpQ[6 @x N7I" #vL8I 1 &m00Y 0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3 7nXgxfF`/;Nk 0L`/@(b0xg< a5yk =!\*[x? />yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa >[|w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad% LLG,;&bkK!rK\$)o\$\_BrKHB5aFVOF#'|<\$x\$qew a>vaYla0/a~&?~<x[&;O\_:v"EnLJ<hY>^g;11In|vGK2lf}Km^I\ihcM6?djoK{O]uR>Y#BSofx >xvo|\$wRR34Z{7%GbGl\_]7{t YY>&

 $\label{eq:2} zHy7ePLqiS=!113Aeo~p\%:_$\% fNLdLrRb(/KR0)QK\%:*A;:L@BhNV;/$rIhpq;,Z..FGq0|j=*\%hj\%1tCLXpB3be$+ LtHsY1KBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\$KW6}+E".\%iEE JttOet=uP9r$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu*/A;J*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH_sRZSjV3L*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G_h;vJ.WIS$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/*/-qZ*$xGi{kU!=nNs.i} LO>%KX\vmoT0o3&w3v.JHp${%9N%t5X@x?9TS7L[7]BQ"48]Q>yt)E?Ux*R%:YIqz^[wyIA N$:9hC:IK%"<\=2h{Zx#$gD} )WS6&@Lx}_+Rjq rcP6pUxXDt$ 

 $\label{eq:sonward} $$\circ\rM/g^L#4py;gK7V|8qBN5$$ 

```
\label{eq:cmp-A-iKzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55j>8/c%Kh2s+Sd%}o-Gg#GW_.=n=S#}wMEEEK1&0K+v.]/xuNM~3]0k
```

 $ERjU{+}8{+}Z{*}UJc\_isCd$ 

j(c#}{9YpH"bPv[u|h5r;

```
\label{eq:mr_action} mr[A^zOzin/X{wg|sMtAfU.|}d*m6OYFw^]qRX1'DvNCs6n1@[8&n2]39O]=Chm&0)[I2ug?<6])T"""hb =z$7jHEC6h kt_~={}!J}Yuq3iBtEi2e/e9R~}Y5o.+WVC5IPGKhYAP3g0[
```

Kg2\*m~e0m~|ma3<21&MTSO=ke.k>/|7jiyLS`A;{O:v(7x5k#</>@^u-7j\$z--S2dxSLyjm:6\*?

 $3^M7e^Z-1?; W\% y8_8^2qD=DvZJF4nf=c!@>/8/%Jhjr}7\4H<?q]w \\ v?, [.[bEiVfmjq"-aC!KK\NOA-1]) \\ v?, [.[beiVfmq"-aC!KK\NOA-1]) \\ v?, [.[beiVfmm"-aC!KK$ 

@4Cz!)\_';zbPqc1cdK}C,042@1v0F[v\*:uR1D00?FM|FlsA

icuZlask

CI1 ZW\^#3x |G94i\$0.qE9a%'\_|Q@0@P\.RT

D;vnT\_V\_V-1b@;}QYBiOOXB/>xB#c\r.?PQ0`5gF]mFg8

 $Bx6ia.nY_{qA0} wQQDopRbOo\#q+@$ 

`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T

 $0!BBi]kB@h/k0cSG_F_PW+c;kyK;1WW\$OFc;rrI4y^-~u`h1uF$ 

 $0/kx.l\#_5@\{HG(c2^*?u!@x/0^; <?99189r!bM)Nq_1jDic`V2c<Vy[<TzTI\$='!y\$SL \!df29fy80Bca]70$ 

aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca={c=&zg{s{0W<3EOH/)SHIISGn\*9s0YxTREJ,)K,8/(QB"##eeR@9yTVMVZ%111iSYrTZU<(ua/&::ZjB#  $G{QF[omG>(7|0@rwo)\S:w,}v{nwIJ$!!A?.W_}<X-*5j/ao/Cd*,.AAAC$))Ie*8f'G< y1B|>s!1c;WEka$ ][opcK^NyB v\*F]vm|zM/[n+SX1cG0@;CZl)5J>i)RD\_f<M6vZz,ukDDD]w% Q r'dka;9+00{0&0a S,>#))lHxh]haFOskeR"(0@}Qdadg,Dfa?y0Gb%11aM0"30 aL`0`ca0/a~0&0a 010 aL`0N%08?\$0G%2\_^aal:|0c`0`ca0/a~0&0a\_010 aL`0`ca0/a~0L#xUVyKgruI"EK>nV2dII."Tk975kz0;d#Hppz2k,iws+reIk2bITT )))\*=xw 0Kdy9pzyFDz>,\_~,XU=q];]IS.]n\_>a,0;er-Rrei=ZsqTTI\*3gn{I[7INN'|Rm+'OmqqqcG.9R>\4i"=?~<RF \$G=>n3r: ]3gSBBB\_k~[~IZlnZz{s=ZF{aFvOq2qDcI]e1jN:uM6zj7]dIOaDgxb]mn`1KUl\aZjic=o\~Z>}k;,Y"k>=!5j(TRZW0#  $[38r4K{ ^{y<.e+(P.'|P3x)}}$ ]v ]&:#ZGNogy~ i#qyi>gg}v9rxLeDt[zx<uv]^bqBn]1b.;"q]G}VZuFzs]waFv%=JeO}X L.? %6KLL Wq2`wK;g:G/z661+W5\aQhtE{ }^ytsjy;wePfrB \_hhOW\_?\adW\`pm8wB=|L"'OOE^G> h|GENkq?r~s-)+ FUTnIaCh`?# eG`/FtIjpGit;2r9so& \*^X'MNtc=58^g8\_Z"??yd]v{"EN4t Zc"#zK.6l}Eo]LUIYZHC%K0'Y\$cc< .g8y7xlsD3<xP-)PnSa+g^gT jU 7sy:"}{#`?Cdzk1^u BxMx-m:k08.<L-[j?P}C/a, -=TVM{uV6bs;~n+vdn0%N:nAT17eLl08"30?a0&0a\_010 z0x?")IoK``Yp4IX\_9t|j4mP f2nqL|349ai#6rDEE}\*.44Dv9q<cG=/(N?-{\$,4@J-RPL<~C^9"%x<wk|<nkHhYtiS.|HySad.AeKAZB+]#2"4x1F6I-^L?L,Zc?|X]d5S^w-\_;iM7\/NMIn\rt?~o>UqQrGG6KrJ.ye#6eI.ykH%V)<54&&d\$\yQu&G."i0#pG+/]sn4n@J\*)Z\*V(/2zOS9x\*x;^y)\H= &h>11ddsK -RXohhtpHagXd4hwf,>="qP"X;LdCA cE4&yUdJ\*a&0GQ5a\*@;88Xn~v\_pJ2e~+V={eZ2JbRo ^\_j>/. Bxq(:Yn\*|g{,=^8Ni;Q2nGmKUS&gm]`g\_~5-[doM@\oIev>5WDg;#5dGu-2uL[bcj!4GRF5C~QR% W>GvkDHDXi0B>-K'cc\$"ZDh#t"K2eR0/9xVNQ? 5U]Hd|R@~Z#";}6zEyQzF+^\$\$p/VTV,oBTx&5M)ZpIJNyr;y|)Q<X6iIOGD\$8(@NHp`(+7%HJC8QY-A;Ud6nO ;eP^~'5s0:t4mR5 Dt/+VP PAk\*73BmI~ddYagK0K?aZK{nKY7|-~wXby\Y#Bps+Kf|5jwYt^{}LL<Y9|8]v./c cc>'N}x0R`#Y~KLLzoO%?>~XY?^7 ?f6m|@PZ30-4z^KR Kw\_EYCz;>  $7m\_[\w!C5WPbJ~sn\#Q5[>izn:]E](~e:Bznrf=(Mn?u~qlO>=6.\% m{@nXmA5k\&svG\#c<zhI\&rj>q`)g?F\&M+R'a1\)$ ={MC[j.c<wUK;o<PBonM:u?+BG:t([n;u(~PtiOs+1F7oM@-ZTo)S\$O<1r-\_~?\_G7n8}j]1,-[V[!</R>|1B 3L:UGHioJaRA\_^{K:mNFd\_\_A#

5jwO<KD'\_7~'\_aVtMa,}QF00a,YRsW;WK=oV7n1xkAz8P^F S5k[H\s5zN.BQG;v

W>N6#;#G]C[oz-Zq~LgqFon#2<Q8?`ct8q1hy>-381#Gj;vnIvy#iFcq~.38MuyyK.g:t

 $\label{eq:constraint} U \eqref{constraint} U \eqr$ 

```
BBd<IoF #\9QIH6^7Ot%$7EP0d s<G
P7<(m+Y<0#c7m%D=?u!@>Oyk'xNBB]y|LH'7C~i#dJ.O^&Cixn`A%^O8A>;`i"o>
-"EhyWxLxsxx^C{9q[P>+H:n#nd;T#A?b]k#x6j|^xA'
0"C~gtMFa`H1/yzJf
gTu"O(! o@'i#u =M~SO
\Cpl`#3.b$T6"D?_'Oj\u!l.S6hBu62m@X|t?`hB
z.0 @l='y/!)nj J{1XO=6E8K~pFN(Iz1h;9AC!Pnby BB~?5KHs7GH}AHuw0fl?P~@.#6MZ2cQ |;7<
m9~rI?7sk%Kr+x Y+y|6'-v"_/g.gB|-35acOa~fNxd=:Pdd'Z`!R6Hw7*%^6$/'>91&9 LC1pn7d|aa
L`0`ca0/a~![}amyR^-?L1ax
;w;w9|.bWHr:i2IyqTbrvOH$wx8M=U;q+2;<}}aFv q
XfI}'
[Obw(T_]/>=0.25] = 0.25 = 0.
Mi=`!=) Wk#EqoA-6nu-uOm!.%i~jB&2]@
IIzIzu]-W_}z_^$wxyryp"GM2E
Ge/T|yy0}}qZ`_%TN:/UK0L`xyq_u4i@J*);]#+U;?A\wDEp1Iciz;(RL6SAL1Yd:{DGEKj~4j}r!M,{C2D=|`9,r6
t5MEHa2syJGU^
0L^C
U
]e!s]wHV~WJKSyE4nYBBN{za}Eo<Br+r=#e lc! ^eD9}:{My0yuY%}ca )+-Y\>c@h2
t0q
u5ixvCGHUeG$)9IL!uui+D+Kkz^I'xdXG`-6'8KrF2`T,Z/0^8)2}Y)ad ></ab V&ul\\kmygzF}"
}$4$Dj8BA*2_>?RW";v5B
Z5'IIRd 9H*%**ZVVECR%5O.AArMv/})Q<X6Lbe9h" q ERRz/q{\
)W$2w#QmM?$^:nX;yOaW8)ev<jNd@3}Gyv ? M6sM!z 7EpfNZjWR?x <+[3eFv& P0H?aZ7N6mJ}23v%C.e
<WwX|=zu|/Bps+KfinH|1bwy`B)t>mO?T:v!|,]zA_07~k1)0C~X7n<et$&&F_9xccceu#spub1e|'_!=qE9~|7_v/!`/_>}]
O;oJ#G.CGJkZ]((ml-#H2<,\~'izr!OHuget&nLm#,PO
Gn{)4n:p>}{mq-^X=\#{nF}}
?C.R{{:~^0cKfuxta\h.mj52qD+uH#9sB
w'+V?:cw!Rfs,<,X@=
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3IPM.NoteLicense URLs and Parent component details for Windows 2019 LTSC

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MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange

Administrative Group

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MMALAYAN<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.pReceived: from CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17)

by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

12:38:28 + 0000

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

# <SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com> Accept-Language: en-US Content-Language: en-IN X-MS-Has-Attach: yes X-MS-Exchange-Organization-SCL: 1 X-MS-TNEF-Correlator: <SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com> MIME-Version: 1.0 X-MS-Exchange-Organization-MessageDirectionality: Originating X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com X-MS-Exchange-Organization-AuthAs: Internal X-MS-Exchange-Organization-AuthMechanism: 04 X-MS-Exchange-Organization-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe X-MS-PublicTrafficType: Email X-MS-TrafficTypeDiagnostic: SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_ Return-Path: amakotha@cisco.com X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883 (UTC) X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000 X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

### X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

X-MS-Exchange-CrossTenant-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-CrossTenant-AuthAs: Internal

X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:I;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

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Marimuthu Malayandi (mmalayan)InboxLicense URLs and Parent component details for Windows 2019 LTSC image)EUzgbOSIq:(Zi%:(Zi%\_substg1.0\_0E1D001F\*j\_substg1.0\_0E4C0102\*CGm\_substg1.0\_0E4D0102\*n\_substg1.0\_0E4E0102\*FHo\_substg1.0\_0E580102\*p\_substg1.0\_0E590102\*EMq\_substg1.0\_0F030102\*r\_subst g1.0\_1000001F\*JLs:(Zi%:(ZiAG~M{nHHi Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

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(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANAman Kothari (amakotha)Aman Kothari

### MMALAYANAman

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*._substg1.0_4039001F*[_<_substg1.0_5D01001F*$_substg1.0_5D02001F*^`$_substg1.0_5D07001F*$_substg1.0_5D08 001F*A$_substg1.0_5D0A001F*$_substg1.0_5D0B001F*bd$mmalayan@cisco.comamakotha@cisco.commmal ayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt_substg1.0_5D160102*_substg1.0_5FE5001F*cg,_substg1.0_65E20102*_substg1.0_65E30102*fh_substg1.0_80080048*_substg1.0_800A 001F*emX_substg1.0_800C001F*h_substg1.0_800D001F*jlY(!eyJJc1VybEJlaW5nU2Nhbm5lZCI6IIIsIIVybFd yaXRIVGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hF ZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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"@type": "ExtractLanguage",
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"@outputVersion": "1.0",

"@source": "Bling",

"BlingDetectorType": "ExternalWithHints",

"TextLength": 700,

"LanguageScores": {

"English": 98.21429

# },

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"Language": {
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"Locale": "en-US",

"name": "English (United States)",

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"BestGuessLanguage": "en",
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"@type": "Language"

}

}

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"@type": "ContactPoint",
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"@context": "http://schema.org",
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"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.url,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://hub.docker.com/r/microsoft/windows-servercore",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 53

},

"@EntityId": "0d787665-7b59-4513-b6bb-c5914e04f509",

"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=0d787665-7b59-4513-b6bb-c5914e04f509",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

{

"@type": "ContactPoint",

"@context": "http://schema.org",

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.url,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://3rdpartysource.microsoft.com/",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 37

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"@EntityId": "a462621e-0c87-40d4-b609-0240ea9df4be",

"@ correlation Trail": "Extraction Id = 69770f 49-18ba-42be-94f 3-86839 da 8be1e; Entity Id = a462621e-0c 87-40d 4-b609-0240ea9d f4be",

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"@type": "ContactPoint",

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://www.microsoft.com/en-us/legal/third-party-notices",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 57

},

"@EntityId": "c5c5602a-d6cb-4f8e-ae60-893ce3f4b49e",

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"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

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"@type": "ContactPoint",

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://github.com/microsoft/containerregistry/tree/main/legal",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 62

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"@EntityId": "13565f67-aa5b-4875-b270-a914e1e2f098",

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"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

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"@type": "ContactPoint",

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://corona.cisco.com/releases/331413/images/1186257",

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"url/urlTextSpan": {
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"@type": "TextSpan",

"beginIndex": 0,

"length": 55

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 112

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7b6ee6af4813;IDXHEAD=01DAF2FD36;IDXCOUNT=1];TFR=ThreadForkingIsDisabled;Version=Version 15.20 (Build 7875.0), Stage=H4;UP=1\_\_substg1.0\_8016001F\*

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!"#\$%&'()\*+,-

 $23579:; <=? AEHIORTUVWXYZ[\]^`abcdefghijklmnopqrstuvwxyz] \sim e; DNRT=Microsoft.Exchange.FocusedInbox.Models.Heuristics.DoNotReplyFeaturizer+DoNotReplyTypes; SCAT=SameOrganization; RFV=1032232302:-1=0^-1927059262:-1=0^1146315108:-1=0^1810071250: sender-4814ba42-62cb-4d22-9bd8-$ 

754c802ce6f5=512^1352796317:recipient-2bbb022a-9d21-48d8-912f-fea5626843eb=1713^1352796317:recipient-00826e84-cdce-4955-869b-660b92e52172=2561^;SV=1.0.530.0;SN=DM4PR11MB6405;MV=5010;CT=8/20/2024 12:38:30

 $PM;ODF=Inbox;IFIC=<null>;HDTR=0;HDTF=V15420240627.08\_substg1.0\_8021001F*\_substg1.0\_8022001F*ubstg1.0\_8023001F*t@\_substg1.0\_8024001F*z|[$ 

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"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://hub.docker.com/r/microsoft/windows-servercore",

"url/anchorText": "https://hub.docker.com/r/microsoft/windows-servercore",

"url/prefixText": "notices and Image details for Windows 2019 LTSC image",

"url/suffixText": "https://3rdpartysource.microsoft.com https://3rdpartysource.microsoft.com https://3rdpartysource.micros

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 155,

"length": 53

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"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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"url/anchorText": "https://3rdpartysource.microsoft.com/",

"url/prefixText": "https://hub.docker.com/r/microsoft/windows-servercore

https://hub.docker.com/r/microsoft/windows-servercore https://hub.docker.com/r/microsoft/windows-servercore",

"url/suffixText": "https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices

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"@outputVersion": "1.0",

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"url/prefixText": "https://3rdpartysource.microsoft.com

https://3rdpartysource.microsoft.com https://

"url/suffixText": "https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 249,

"length": 57

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"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

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"@entityExtractionTrustLevel": "Unknown",

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"@schemaOrgVersion": "1.93",

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"url/prefixText": "https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notic

party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices ",

"url/suffixText": "Have also attached image depicting parent",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 308,

"length": 62

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"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=3f608f7b-2053-4d99-9bbf-c513b756a88a",

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"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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"url/anchorText": "https://corona.cisco.com/releases/331413/images/1186257",

"url/prefixText": "component This is in reference to SBOM",

"url/suffixText": "TPSC scan https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom Please",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 456,

"length": 55

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"@type": "ContactPoint",

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"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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"url/anchorText": "https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom",

"url/prefixText": "https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 TPSC scan",

"url/suffixText": "Please let know if any other",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 523,

"length": 112

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"@outputVersion": "2.0",

"@formatter": "TeeKpeBondCbpBase64",

"@schema": "Microsoft.Exchange.Relevance.TeeKpeBondResponse.TeeKpe.TeeKpeResponse",

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\_\_substg1.0\_5FE5001F\*I\$\_\_substg1.0\_5FF70102\*JSalil

 $G\ K\ (sagk) sip: sagk@cisco.com@B+//o=ExchangeLabs/ou=Exchange\ Administrative\ Group$ 

sagk\$W,WWW0"000}TW9\_properties\_version1.00MX\_attach\_version1.0\_#00000000<^Y^Y\_substg1.0\_0FF9 0102\*S\_substg1.0\_3001001F\*TN9@9 :"@:\_&\_@W\_W0Screenshot 2024-08-20 at 6.00.11/ PM.png.pngScreen~1.png\_substg1.0\_37010102\*\_substg1.0\_3703001F\*V\_substg1.0\_3704001F\*W\_substg1.0\_3707001F\*XN

!"#\$%&'()\*+,-

./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^\_`abcdefghijklmnopqrstuvwxyz{|}~,+PNG

```
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2+!^$
\%
Gn*+@2L/7/o4mb>3iirCX1y!
ig:wU5K+3I2
q(=2)
b-?r{Qj44Aa0g@bg>70b#EJ>=Ct>AqJMIJ_hCR_Ru BIY(LX
bp,vD+X($@fHc%y6e 9J +>T]X :AcQBR V1s 7DC_'38lnX"|91@
k:)zH@&G%38"I#8PH{_Xd{#rS@8R(D2x* aA&BH=2-A@b(1h7Lsp O GNy:~2?nx2Ga~deYa4vg
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b?D2
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\uuTtu9tg-^@D^'AA
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DqVF}8S4vdqq;/ MhITOX>)0,3yD))TRjbAcW6x6??pB'r'O#%LVs9U}<60
# edetgd*C7f3[GK;$Z'L:C .wNzr$\-T
_}+?LITiO{Vt:ozsg < y2+}Vlfw c.un9+v~,xK/jn(.j_{j}WJKK,-+X)
Eo[L1+V1VzzPHtVDT4\|uYWTWU-z
u7nI
[[
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P=@$@$@$@$@$@$@$@$@$@E"py$@$@$@$@$@$@$@$@$@$@$@A
  E)
$@$@$@$@$@$@$@$@$PP(H$@$@$@$@$@$@$@$@$@$@$@$@$@
   @ @A\d"
P=@$@$@$@$@$@$@$@$@$@E"py$@$@$@$@$@$@$@$@$@$@$@A
  E)
$@$@$@$@$@$@$@$@$PP(H$@$@$@$@$@$@$@$@$@$@$@$@
   @ @A\d"
P=@$@$@$@$@$@$@$@$@$@E"py$@$@$@$@$@$@$@$@$@$@$@A
  E)
$@$@$@$@$@$@$@$@$PP(H$@$@$@$@$@$@$@$@$@$@$@$@
   (a)
@A\d"
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   E)
$@$@$@$@$@$@$@$@$PP(H$@$@$@$@$@$@$@$@$@$@$@$@$@
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P=@$@$@$@$@$@$@$@$@$@E"py$@$@$@$@$@$@$@$@$@$@$@A
  E)
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P=@$@$@$@$@$@$@$@$@$@E"py$@$@$@$@$@$@$@$@$@$@$@A
  E)
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Y;%k)eIdre)Q>Ed}[t\l<<%%$!$
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*Upw3i'|2P4gywe0
(VX!#GV@7n,_|tM6l2w^}U[cK @4;,
yq`Z\rPq+?N;V~:`6gYvlR[Ct2RLTTI=O*&[0^'\szJ_^RSSLpA,GP
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@$vU
otDS& &@A /G$f#-[~AHUVb@8
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0saVZ$E/"Vw'F V a.|aJ>
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QH
.=h
hFyL+10?c
6aT|ytNG<;D;8+YgTuSJe\%2yRfMg1I~\#/6U=z3@"F=x)IvDupTz)Ws@T1~lm(d\#~*FR.K\$\#p'Ju4K_WOH)
Y_6 (\% RSSN {!} dOE' {e} FX ~Z {)
0obJ2$"^x i#On:g4b9 3e`!eG# (|(k @8\Y
```

```
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kUF$@$P0@^-;wl82 #pzg+f]wu#-sU2|p{L}>s4igbc.6FoV(H}Z |^50[:/_.[n
4cGu!6jI_MN;SC[v}GH[of|S7f3\hktG^Hol4
;L[R"?^=Q\#>S_B?U = \{ov9c\}x!pU\&>bD]\}1Vs\{\sim \wolf\5jgaq;SU[onw+Bgh5Klew
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:4S7;r q
)&L4p6J^>k{14
!)f @HB p&93N;MwjGH/D@s1
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Kxmu=y
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s} Xn
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+WUkUon]K*QnAG!XYRVU! ekyeWZN$@$)
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01^8X0
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)B';p~LI>fsl,>!jVL@i}-vfo8h%nTVl?ff$xMv[)IeeG
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```

c]yOd?v@e)mg<6+/O vN>OmEGdQwjS7q4\*fxq{fjNuvfm{U{<Kc; rUik6E }rBNab=r dc0PLvlh f{9::-"vg,\*lSwZIM[3e\*=2Wt:,&8fy{kz8(pf/^?snRpt lEvdGw=E]ZN:GhLJ]x6%hEn379loY]^E\*\$O gZ5/mA\$Xk%dn]]\*eY^Ju7[RJ oy3}wH\$@%`r;WD p~eLJ\$<.tr7bga1cb}f"?3D]-A1BN&S8!mQ:?6mj(,]SX +C8Uy5nX0Woz\* 8uvGAtr!\$N^r'n6 bSM pVg}|uy0}\$' at!v3MwAXA>C/V!YVto\_`.30~v="fw81+JqtY+&8U=je+P-J@u +jEd8Gdm'K^X kt[n3c%?2T\5ygEISv\$CF|vJTy,1 Udz 2ix<Dp05"1s:e#nuAu"^\$cWwL=J2,c#8dVKJG{+ VV"&~S)QsTd=jUjTKIM{a{HcV9#mwj}~&9SQ"6R\*\$[mVvU7m,ANWrJ[[wSh\$@\$@'@A @0 ec.A.N0%leK%Mh)N339DGx7f;0 \* `=<vPVOh dLc)Wz bqrtmDBb#g.lW87#Mum`6iu[gp\_cwgU:9>7 fzx\}a!VXc5@63,/e3?^Pu~5 [1 I;Fw+73&9O2 fx13d91s//;em,Usq I.Vaf^]XcF6BU!WV:\$C W9-vYZjH`Y>gv[,;P^h(^]Y S^Vip0olZS5NZ=h^\mY!L`tF8+dP=lB^ Y'DU\$?(U\*cjKPJ1tOd^0>R\*T J&{Ko 6eNY ,~J?] }.9hyywfla+~ Y2[%+a=+|E, @\_\$@\$s0+s7o uLBSqX>}EcvYIKutep\*8ap}X[  $G > ["nt-A11F]q5a \} NprG(8uLhq + CDcU/l^tB4p + &"1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + &"1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + &"1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + &"1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + &"1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + &"1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + &"1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDCU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDU/l^tB4p + & "1Sxp \Gammam1C=t5 fh#s, <s] + @.Ex% Sh5mUTan6] |]gi=5SbR-CDU/l^tB4p + & "1Sxp$ <#]x?o91i?)Mp{\_47dRGwD|OwZZSR~Vpd+k,hsvdRu?;Qggspm.BlUa\_V>\}YbvJAE-n+&uCeZ"~o8[Zu8o2,-]Ib|DV(}PFN9v} 2EgCV7imPK?\fJ)r\1UUv|' @d# @~so .D6.49mkWw8^MfjuRi48Lua!Uq:'?#tur'# ;uA0=CVgeM[oY 1k1p !p>];F:[p8eBLE= Jf@Yf[ yh3ZwDX;y<8qcJrd8.#4C;`Z Nvx5B48YB EV6Yq9Zq ep[5.mt7>\*d=6\*Q<Zg\_&k[]B/y,rC,tdpF!lW;Wpm8.K.0dpaJt t#WY3s~ 2rL:E 5hD:X^yrgK2Y~m 0 dU V' X&\*p>:AUO'7|c%16 8p\$-^1j3+VHXA:-g]Cq,t=@G :axUP3V '"/XXq#nnPXmk9:s }`NKrw(ae.=3AV3C{6B}6q2bL ;%D;qA+6'X)HK9;.#U8oPa.?=kd,V;>!o:%^X%Hpc9Xw\_05J,I@[7 uAYu uj r[Cr#ZR 8g4/#enae~o.5s VaSLrFZy08[sJl?mn^urtwTZWCa@?@'p'(LwCqy7HCB-8k%5k?Q)x9"uK%96T7O\*UX/Nip/P ^fd]<.(VcP/j81JO]'TWA s|HFQBgnqqC''\*OnkpW|g^qqLUP7@2y<W9#\*J,?V7d\_Yd\_UV; \$rIS"eiZyi;JJOoGr:J\$cU)\_^C\$[f`Xp;Wx}Ug%?2^ 8qzrRSJ7sq@ol.S\*\$@\$@PH SN9E;Z8 yn6I@p<gwH"{&\_X#W3x=p (B8(\$-;g|e\$dB Hfln5 %\$\$\${a>o=BB /-/IZm.~\*aCc>|110\*8rtu\_ u{)|\*)fV,dg^&;UW%z9umEzD"`L<\FUpuzvcliX"\*e(Tb\;zv\_wuUF>L:kvstrqg79\*;FzahvGSIir5h+P6gH;\$[YG~\7W ^JCCoQ\$r{pWybdjQjeEK4m@psH1TI,vmzA)[Qp6 A ~q1xV% J\*Iztyt+.0i ?Z`c)A^iiiDooowxGJAPp@9# B}}i;a{pc5/#XK/lQA(Es!E H#fY<qNZ@p mL\*Z@o-X Q"wkYaR:B[GZUJY\*v|I99`GX45;M`\*`y9 #5\*Wp]"\_<]ULc)mq!C ?9FAK^=>U%Kt//1WF}Xt5i+Wt~6 @r>8UIH ,~ m2\$8\*8lxX \$cx&aigiVmjjRt

```
TWv#>sf6AiYMG.=.$B~7C$
```

L]vVp)))sYIM}O2E6G G-`\_!|}gTnZB2l!Q+xomN<Z|'C^\*\_'}\*/]PafYNisvY+'uW!6|Yva]S u#i03;RfztyAGKNKSx"v}XBf[P/XruY=g?jWU7/3PR.1QK | @xwk @L=@IDAT^fNHep06kL~ ;d\*iIGp~vyZ?0+QFr+>83 XY8.SN2vX|K,\*4`@!CX/\$qE\z8MA@\z WPpmG+rDb>c\<wku Vt+a5[1hG`y'|AW`RxhB>?xq{=Vw[^1X4HUcnCx5B'haDNA19guo <XN:va<.boUcg6h{eaLis\,!y{d;KrmLyKyIh}\~~\_n,g|N!LI'eRikv5LPB21;?'\*HnmVwj~ i[]VU+/U}? g/6MH Y]&VVI/M'kC^%Uy;=6p]>kbM]k-8U6n,;w(7\=0h-2i@3'4 P (L/^,pzOquUVYdppk% B PH9nsAnAi\$=4+0h>1D\$SFhP pOuST) !9{]y|,o#l[x!:A0J&17ZG;Va<+r"5z;w+P)AQuo&GRQa`i6d%\*x:1ty\xU\$CT.M;w#fy n +'2tm3Jifx>N\_s\$yt] 7>IgyiJx< K? \*D!+2v|t6ER: [O/{d) 7\:\_5+#Kf1mSQ,VlQ!f--|%D4;RoAHpy9VYtx:EK!'dVTBnh\_"[H`u=mMqr%YUROh6d KR9HH"#@A 2n<H 'Mr~:G>`6% 2ipd"Lna,C<;hpye-[466%KUYz ~ep Rj a" T lEr~D| ^wy|G!D8rkHZY rSHw}goqpB !s(Z`wBuj +^ziZ)YEA +r"]|"&%{i~C[~(:\SAn}zsAtQp"INVY\*pBCKfTc\*Qp//M1#?z]qXOT'gHA9|)<R@ ?NM?KJ{6HJFK"`TQBV.XU\_Yc5(n;9=3xS?Hw<PR v`S \$'6\_vyGEVZMWF~yV~ f[I1[!cO~&D.'?xOS5+@mZ I[y2 rsm iC# #f/uA]IuO# 6g2!LH^D6x^xn8RC)t>t(9cP{Wt M} `FI/]h8d `rC9yR"y]ko-[6L@hAKr`\$}v:EZ!L/o]}w1R/bb\_8N:C c0 YwJ5sO;3UN|J '{=r>aV\_urSs %`8\*\ W,mHJ sJH K[CR\$5 ^7U5oIJ\*u=]VJZl1:YnXN/NJYbUc~]{\*Kqd)&y'6fOJY5ZLd[KciU.5dhmbj9%]{ujWKH\$ d?a XL\$@{mBlx!E#Lj\_lg9=+!Q,oF? O8Q[XKTX&CP}o/v.s"<:Pu~J+ O\$.B"EmGyT?6p{uB=9-[9I'L`#i|=Fa"W~Dkva;/A Dm1\*AWZ^bLS9Vm!Xw \$zq1VIeG'q!|BNIaNOww%V(H]%`z(S&Z/M@d@H!+SxzzxxuBmyPUGE@r`Tp|cv=\$0 %CZ`n7>b|@\$\_t}zxS \*]j^91ElU9BLu3g |fQW>rwhZqn,kv|C8!TU F\$@\$?i @Agv~(<f:}S1{4{\$s>|xP,wn[nq~O9  $:3wE > eX503?/gQ] \nWX2E39@?+<y6 > Eo[za!$ `u]q\_Du{: A0 J\wubokXW/i2q]aLg!\*+|}eb9^{b^+hv["8,Y9Qk8y/-@}FSH4<^bG2~`&~b{,|.u~kns|RJ9D)-[e;F ^xyv~\_\*;\rCd7j1x+K;]%sC[GUB1 +& p /pG\$@\$e]Z-/ euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh  $A@6`[yP|Bx*Yt=<\!Mp@='oUL.+w}*\sim\!d*y]g+E\#*\setminus\!y+Q\#^{vk7l}_{\sim}=G[6c'?$ 5~uE 8CYQn,qn3g]tfb}cQP;^,\_=c e81LcL+g;;?j1<m<8 !P49Ss9JRjGh DH0Yq8p]b! m:7 M/\_j9\?L-W!\pNgOIOO},36[6.%&nqO"Q{ {#\_FFr.xLMTy=s5v{rq!Kq@ugx L)+Lz{Gsj23 >Z; $[qmXyYBe{\$@E}gY1rCOy^ m7_SPdMD\# =\%coH D@($ z ygAakyK7Lh;X:\$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe \$paUzy 78?~>XkWc0`&n'\_Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6)\_\_)VqK\$A pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:\${X#(0#THK^ gs\gF|7\*NvM\$@\$;\!;~<H r.ZUpUT;vt9Zb!19PGA3^~C>14>\*3fp.Ua :z)>jNf fu~ Gu%u(+`bZ 8%`\:"q|%T/13g"S

```
,An?+G?c
URx<o;wn9XPNi]jwK:D 4s:U:w5-7]wXH1yRhcKk{(WJ.9j& y:bd %Jh6fC~goHq'f#|n
v8v + b5jlO>z /
!b[Oa$q
cimc=T8PZ{U+
Y/
0%uKG-*#F'w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg
mf'}|wY,v|<ap3B@ASZ?!
! ~?
#8VBX@[B`O?<
33u'|_yQ#86"_ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
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+r2@Bf.wSP~*QpGpp\Y\Fp3o^a+uU,>#+yv4V\1|\P}0\8.dYW\K2sf"H (d{/EuS^w})
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cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$@$p(S"
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
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?(:$@$@$@$@$@$@$@$@$@$P P('
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?(:$@$@$@$@$@$@$@$@$@$P P('
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?(:$@$@$@$@$@$@$@$@$@$PP('
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?(:$@$@$@$@$@$@$@$@$@$P P('
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?(:$@$@$@$@$@$@$@$@$@$P P('
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?(:$@$@$@$@$@$@$@$@$PP(';wD:tbICn
   M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
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7$@$fGb1/b&N%J<q|)M~$6?u;
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mQFgOc2iy')))V&/}z+VVO>4lN>d0`3>
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9j*)VX:>-(*
0bC
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"%\bgbY%ew{,'{
6>8
usx-,#
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g:tampVC tx/#
fIY3fnu
4vXkE^{};Pxqn+NW^{1}-H.92+nkA
!L=Z h([t5>a7 `@_,X UFXmip
```

```
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
```

8

```
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiYjF8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K_|0IHHHHHH,h*
GVeRm$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r
xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
T[.?x# r
O~" @!3JN2U%r {AeS3d
[lq
j%*$/un^[|r-x:)0#g@B,z3zjor091;
y|0D0(C=$2x%p`<`T1M; rB6g11# bXz={CrO$@$@$@$@$@$@;g
H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(_[n':Q5IA0*_fS0nV#NCY_+WsNK]Haa9
8 p~ 1BH
fxC:F8(6b |LizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku aqeJfcpA8?$uM[NsZZPFNe!f&X
83
GcX&{`($@$@$@$@$@$@$@
#Jg1q W%\$
@;J?f#W7aW"QF^BP9@R^sa &*`yg$0@[o0C-?)k_
g_hmf8mBL|E(F [0[00v
V~!zCNc06
HQ)$@$@$@$@$@$@$@'Ag3IF24a6N
YSP1e?K(IM"o)0YFw
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N(Z>}b)[Kie]pB8::ZL|??61 mu'1 ,hB4i>xky
uky/Em{O>qk}unAofb8BM`2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq
\%8w@A
E5P_veyk3gbC}-P>kD/oO?
o<LG<G!}7n[;#>@71"
x?\(-3&B8YF wsX9-(ol\kfU[ZEt'8"dh0 L F={o)_
GKMkf<c360|;1
,kN{=]$6^^uNh1bf$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC
I/b#?F
wU0b}5E|rCa`FA}R|fFmV?G87|WP%Bh4PZ$p`dgB8%/Xg"O?TI}Fbf$xA1a@"n;/G{.>^p~E~WO$EhzJ?HCNII6=
dnrHHHHHHB JLr~EV<sup>(W_s='&y.$/7,[%,<r<3^5aDJ*>=+JW_}Utn7U0+PC-S7!T0]]?yRS%-~0G(PWp>QXZJ</sup>
}q0:!)`5>mm&Sq!00b]HfPHHHHHHHP5.RIrf2N-z{Ix
w;=3Ycd$rY6B*IhQZQj/@<x(0sN9pG%Q>:wFFitE~o[6<x7#:!%!{xpi}a(@H+D1`6I]"R
   `+rHH$jQ
w|Axke! < O[*@\%|4lP)IA|
             TH4T" s?aHHHHHHHQcPJp8)BPY]"$ {@ $aUjDdf ORHT
#0SY4m)fX?
JXDI$@$@$@$@$@$@$P1 A @)jL %)I9zU0TDb$
{\`!aun*^}J}$<Th($@$@$@$@$@$@$@$@KTB #gJ*Oc@Pd!l@@v,>uJA%-
J2dgHLW3'0Ac@@:vd.)X;+SN0
                             0J `ZHHHHHHHHHHHL8IW(
   @IA^
   (Gh(G7]!
"@@Ie$@$@$@$@$@$@$@$@$PPnB$@$@$@$@$@$@$@$@$@$@%E *}V$+}`R~quYZ:
{"A>m`$@$@$@$@$@$@$@$@$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII *I@
```

```
`oPC}zMOV%P "M6I
   (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4
  7@q({OCYrPRN P\t
3GpNb9!0Ac@v2g8a*}!&g+*^SAY0
   @Y`IHHHHHHHHH
 PJ
  R"@@)f3$@$@$@$@$@$@Ft*@IDAT$@$@$@$@$Ph(KIHHHHHHHHHHHH
                     %>&
   (%4h6C$@$@$@$@$@$@$@$@$@eIIHHHHHHHHHHH
  %>&
              @YA,m
R"@@)f3$@$@$@$@$@$@$@$@$@$Ph(K1HHHHHHHHHHHH
   (%4h6C$@$@$@$@$@$@$@$@eI,g$@$@$PK]2%"4PMHHHHHH
              @YA,m
Dba (j%z"&3S{+eGOC7~=e`#%~*[
tI:uJU N
-LR/
w7Q @&@@?F!?SJ;+M}'ZS$wL.Y7]'OI :CF.?fhUk{+%&Kzk(A2%HF-XUke ri##I4S~]/Z<%"<gy,0}\Yr8yR
ThYoM*
                            @YA'(29t[N{;?P)J[65-[)}2<x_~Zk_$dKRbS
NW*Kt'Ks0w3xI:%++;_`gITYnfM)zs
:"}9y2{whLf,ZV O@o7x%5A! D
Vk!@*Udn
PZ;vL6o,|[>#=[r+VwY]g_]|(ZtlJc/P[-ChR?XFXPb0>\{+l
pIt_s !NVTZj?s.3= O#^qNWS~T#
eq& @ADr $,}qlN:-[1c;%:#w(=[6GD[x'pZq>qIxa7HAxWcdU%*R@wB$@$@$@$@$@$@$&$c!I( <uCiii0P k_
{ymJN6MCaoC!Ct;k/gb6*2'B)6lR)+jdtV({Az(c\-fz>j=TuBNU0Eamq\?[fI^iK
  {b)
(vkvyo!}^8qhROC2n8aJ?Oy,]&vVP2@_SdTT<jvl.NVWE.0W<Ki8H$}$k"^K*+CUVnKOgU[2=hV/Dz 7TkReOo-
U~ |ie^^~;%SJ'RN"#&uV~^"|J2-3NPMw:*'%bHy$t)okG+YsUrkdr Mur|"[d2;/:^/M;du{!9|$A*U
hy};+dX,P?:H7z-jzB?W(s/+WukWV?F*hs@KqZUuN.^ia{OY%9?fS_y569f#@?v
v(u.YllO$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<*tRSrMg!>>rAVr'JyYYd1IW
Vu{IF3~Ucx}z^MY>@>gc7>6Z-RL}oP!/Hc[v{]&
     (^4/OF$P\RR.]>+ygedYzo6^BxRhuRJ$~F'EP-*HzC2"SiiI2WQdRJJUINa1
\{8^g Hv \cup O=6\} > sT2Z1 | j XjS'db2*Gjl > sT2Z1 | j XjS'db2 | j X
]m#*U*>Z(N<~BQ.:7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS
Jip;x|| a~Q,2U\% vra7G!2<~qj^vv{([}Q_ks\&uxhlC>W>XKF
96\[2QrrlSV,wHPpeA}@B?^,_Q9K)+]VA@pNxR^~c}q(w?Ir+_t/~"*'N&)U]p~Uca9Q}|<{29[ezcpBavYKz
k6I+7HHHHHt8UJaB$@I`;&:
u7EIFd2ydGHa89,$@v
90 I&<W y2<H:PbL3wy3<xC^D+U
KPRne[q.c@!rMJrX)Q&rkGk(/mN6\]m"K6iEk/}y\v5B=^6Q>2.rR P:U LQv*2#uyX<)cv)n2`Dq5[d5aTdu4k8PM|zt
OSf;<C+H7o-S%womh\[vVJe`Xn12ro2kB"5cVa]},YF)<,vntU+'
\q@_i.SUy[?ic}7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2
PQ^v
9<>@aV<0M;mh\&|Iy@A^2/YN-J{\9^@ dVYU60%-5:eO)!Q
~xwppW-8Gclv)j,]AXOWwnfnx&~6W[u5&0aU\nmVw:24L!j%wVgcGLfOVD$]~}gW0cwiJArbYD|-IHHHH
5
xw=ZOHHiBV; 6n6ydui&iGNoKq2O \end{cases} C.(SSjeL_;f]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7sS=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO{f}]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO][cM9:(c{H%eTS!Z=_.{fH}}7ss=HuO]]zss7"/>RddCQ[
U]#of.:#Os_|BvxKIr AxKPWF
>)`$.*PQ2:DWHzNJ0{R_FiD.urRFvHduS5|E/
`6e.O^=:qk
 <PFV@
:f8wfe]2zfP6??0b
P[
O3@WN>*t(\&(*=wT<`s]C!w
a:rZyV3<B3=pPe(mBySn`*$YRB7?N|:U?Z^~c=05*r~SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k
```

djNE<zJ0`F [Uiy

< &

a8OuXV`nz]0.,||3CD

 $>*J$@$@$@$@$P\%' p=zSjc_,$F0K*;v:tPTXv+I.J $&0g(oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc]#fkXblm1PGU YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]Q GdHE}PZ#Od`uG((!69u<ho7Q8(wi`'/_U(m'{Wu-Ve}V)9rb! v+`A{o!k*OPDG|>z}S Ka$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 $8p+I7o do 10 to 10$ 

 $x < h d\Gamma < xl(]AjdWra oI&<Oe73ty#Oh61oR3-$ 

 $GHWx0?.E9tk6{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m&$x*b0;x{Ktg#k==$8G}]i1u(e)B9Iznxi':.$FtlcV,r~y? ^v 9mt(b&/ga5tP{'i{w}}O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj*rq=;:PKzOf$ 

m<ru9)GxB\$@\$@\$@\$@\$P^nlH@(^Z

 $\label{eq:constraint} \& \-\[T] nvYtiA \& W \! y9 = \! = BtR'6cUum5TXc \% fwy(\_7WJGaWVeLye @3.v#_[Y=r12zU-F7mUV\_bctRD*] \! = \! trainterpretation \! traint$ 

[])(f;:f2UU7r?XR1\_VCn'Td\*xOxB1~%0OGcDRd< 8\$16-O8gx~I]NaHLC!

 $(76B @ \%O)gIT y_h \{1y9z \ R=Uo@?Bv^qQ + eam'WWRrsH]RMyD8G' < Bv:\%$ 

D&07]

iQy\$X>co

 $S{x2xX\f<}{5yri2{Y>}MdyaduB Wb8BU2y}$ 

f

dYHN s;De-DFFHrrXg/Si\_]x.U((#fB 1hVc&?K3o6SSF

 $BV\ Px0eh/e\{wy5B \$@\$@\$@\$@\$Pz)=lH\ [u/Zv\%4win\ dYHQUrKRdnNt\_.=n-SE~<16Q\{u\backslash M; 3Mf.s$ 

\*HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+".

 $:mP!b[zDLUgerJ\$ddV_?\_s.Q5u@eG\_s@>Z\&<-<qjo$ 

 $BlR!OdEnfNm < :5kBcfcf5O + ji?4J9 < \{ \texttt{~Bv'u\&R} ] o?wS, [[UcV*oW/Eq0\} < RFec/d \$U(\texttt{~Pv'u\&R})] > 0.5kBcfcf5O + ji?4J9 < \{ \texttt{~Bv'u\&R} \} = 0.5kBcfcf5O + ji?4J9 < 0.5kBcfcf5O$ 

 $\label{eq:2.1} $k0D\% S9JA;k6ly\% u] KWvy2Y^*w<O9+;; \{ \ (a40`VO\$Pzue)rUWo; sg5j!l\$-2000, barrow bar$ 

 $nSC + = "fJ(Q(@)hXIR39I>Nn)#c0_H < SOKr?[pCQQN^{{GkI.\%_/f^{*}T}Dx^{(2_ts]c2kKjvP@BUc1{?L&\#GS{g}}'5Mid8M^Zu/s}]$ 

P|)W,g{ch/dJ

7s`.w^I4]CT I]{yK)>\_z3e0',[AA,/UkISgt\eTnXK \_#v@y

c|)U[]]"]7ca]^Ei]f9cRop\_g1`Kho{Ms'%)#{#\$[#!O}Nq}Y8q[5o16one<6PyC>{mR 0~!V}\$@\$@\$@\$@H WQ) ( IIIysUwQKSl=K/k[ozX\RYS

 $C@B!o|$o+zm?Q9C.\&SQ_>i@U.(S~Y*Ik,9BTw$+c{2'pxGWc0V3^?Zw{'iO`} \#o{-Y38*}})$ 

t%X@8iV\_oyQ1T1?j

 $\label{eq:main_states} $$ MY*W3 m5F.epko?V<(|_MG < g^?a_('xD%gSeN_|/)j @ U%iSXVMd:_{}+mxxQmCem R%q1n@ #0W}FRJXBi5ko}Y)?4M3|Ux0@0Ka}*\qPXH.W&ZN)NQ(cVht3`A]> kD!*AqLz'(1(u1*F=-8lSo~mwx+NEs8)Bgco8~2n7W:|t4egz8ecM$@$@$@$P$ 

Ζ

b\$@\$P\M62p@8q,[L4iz(On]&>>^.rrw

 $([P/BJy8k9g>aJ]X/g\&jlTa`[Dd\%rR"/pb3oa\&\_.0L6c+?q[5I\backslash(,>J^*n9Co^{<7}G)HK+cFINm1n*c;EE)/l-jF]$ 

```
A(|\sim vu*cP^9T\%X < dW B4JtkY(L|n{iwR}xky;zi7Jz 8h@=B.
+=
h:J+^$>yc
fqo^n:@Toc V5"iw}Pwp{ymlm<a0S*3bFU.pwB{vmuy]F~V1[<;Lui;/h>P=!x0VhM R
<~\n{%SYtYy(]v$dHilU@ X[*U^-P-$;9mf$"$z{ uVUfg3K]ZF-ovlu8S+{dD3$\yU
J#_PO+C<DK d,jE]U"SHAgK5`
7 uq8b^2 })hRBp@ 5Pr8yR++GBfs.PBrT]gjvDB!4U37?c#820j`?z2${T5DWSIV5eH8cU!asaD1xe2-
X.=fxFNT1]6! (***AO$P9rDNkJ}cvI]
uhR>U))^AiPR
aPWn^n@ #.PU@qY/Sa3^
G''
#.)\GI~VSmOiHIZ)O7Jn;w5)3O,C$@$@$@$P04K -[={;RdtX>l,0vH\87GCK`HC hK Tp,W3WO(TV\'80:-
?JN[Z
zj-r\&
)$HHHH** #d-
&v{+$@$@$P
ru3a)k> 32
M$@$@$@$Ph(]lHh:tH4h wu<?ujKU}(WIId!SN\F4oPjz~U @!@@>}z*$pGGB$P1 ZO"^
   !hV$
hWF$@$@$@$@$@$@$@$@n4QpHHHHHHHHH*.*
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
   F
n\!
hWF$@$@$@$@$@$@$@$@atopHHHHHHHHHHH+*.*
      K{oye$@$@$@$@$@$@$@$@$@$&@WHHHHHHHHHHA[^
   F
n\!
hWF$@$@$@$@$@$@$@$@$@n4QpHHHHHHHHH+*.*
n\!
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
   F
hWF$@$@$@$@$@$@$@$@$@$@$@h4QpHHHHHHHHHHH+.{i2 o9"[1*UHfrEO:%6m].66w TN8W+!
g?WJ$@% @hecGQ\|r[o:$CHS
QrY}P\UyI}ofi$sxy')~^ILL}^e=%)Gg0**SrIIIv\oY\ol
]5@%0m4Yf?#|[J^dCBB$..Nbbb<0^*'Ov|_0.Qu?2]b][gyg_?_+-FJi3g\~RzuLzIZ_|Q0Rtx_?^
,:o)Eo5sfxvq\kaEp x#Ap? @'*.t?}x1cd `{O ;CJV<?_]+h?C>wVSUZUM['f^x~(2L$B-`lb&8
vcq`riC~JIqxW0kXk|w=zykZ7ow7f !d1m>H~m,4H/_gA`:+'`P-5W0!_|EWL$@$@A_R,G$P
M>}e6anq<DxC*2pBDg6uy7
> \Gamma wurk
O?y1cA`
rI]^OIr7"%_]n3@_H-/\q{w{<ep2QFi?i:
u71ojKk{f_Ef,,JpnQEis[ogYl_(Hq|o`Y_vqs(\Z mQHHH|&@|y$@^ ;VFDDHuXDbQ$Elk)P#Dx:\
B\wqr^W_P!6>GeJqXHk:$r:mI|A#Pw-b7mTnUN8!Fy>32VZe&$f_`\Y_~}?0c-
,,L}Fh#_E`WZ5=aqN8sNa=w<";w:kWAl~'u{NFA0LO?/w!/5k&p,xb=ICCC(=cSGs7FkFy'U|bc\{%@IDAT
WRE_0>-+~%Ku:uQdB0_bf9}gf2V)7'(b6
xO9an&Abf91V-?~ mcD$L>=
Ba!.;d76o>
qABx5kx[>|>w1ou_z\%w0:1$w
x;^;^Ai=cvx"Q&M4mi/o3p=0GEEQBb}!t%)x>|!]5Fd7Lae_]Wy
uA~7rI$@$@+WLy$@$`#
?E_N%(d
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 $@\_oCcy^{(z=yrI'Mj/-*'_)I?2vmWnr/&yew/x^>tdZcR''Q\% ?VW^7~:IStQG8d^2c0Ae^xM @ @O^Y/W_o:SVaV-[6_Nn=+{Q2dd7<h+_Jr{?m^?CIQ[}~r'-)z8\#0k_r7Z^C)c}$ 

 $JupN1K+mHzu @ @OCdgQL < d\aev \ | PHO6s) \ C|]rw'L8AIQ\%//ZdaFJk=uYI \ @ @OCdgQL < d\aev \ | PHO6s) \ C|]rw'L8AIQ\%//ZdaFJk=uYI \ @ @ OCdgQL < d\aev \ | PHO6s) \ C|]rw'L8AIQ\%//ZdaFJk=uYI \ @ @ OCdgQL < d\aev \ | PHO6s) \ C|]rw'L8AIQ\%//ZdaFJk=uYI \ @ @ OCdgQL < d\aev \ | PHO6s) \ C|]rw'L8AIQ\%//ZdaFJk=uYI \ @ @ OCdgQL \ | PHO6s) \ C|]rw'L8AIQ\%//ZdaFJk=uYI \ @ @ OCdgQL \ | PHO6s) \ | P$ 

@R`W(9|fmJF/T\`8){NPmq2B{.wK=iu @ @X'V @ @ @AGE @ @ @`,k @ @ @HD6 @ @ @\_@@`\_Cg@ @ @F

\$ @ @X: @ @ 0R@@`\$

@ @ @X @ @ #l@ @ @ @Id @ @ 5t @ @ @`H" @ @ @/ 3 @ @ @#Vb|oFla5wN @ @ @VwXA @ @ @ @

XA @ @ @ @

XA @ @ @ @

#### XA

T @ @ @`, @ @ @@ @ @ @ X @ @ @\* P%< @ @ @%, /S#@ @ @U@@Jx\$@ @ @KX@@`\_\F @ @@H @ @N @ @T\* @ @,a%|q @ @U# @ @XK:5 @ @ PG @ @ uj @ @ @

T @ @ @`, @ @ @@ @ @ @ X @ @ @\* P%< @ @ @%, /S#@ @ @U@@Jx\$@ @ @KX@@`\_\F @ @@H @ @N @ @T\* @ @,a%|q @ @U# @ @XK:5 @ @ PG @ @ uj @ @ @

T @ @ @`, @ @ @@ @ @ @X @ @ @\* P%< @ @ @%, /S#@ @ @U@@Jx\$@ @ @KX@@`\_\F @ @@H

@ @N @ @T\* @ @,a%|q @ @U# @ @XK:5-?,[lq< @ @0<%@ @ @KU`R=U=v\{Zr!e]vv+ XY`\*?V^Kfr. @ @ @-?OW\_W\qE7-Ls)~j9DR

@ @,F)Uf @ @ 0KwwqCZrg: @ @ @`3< w+w~UW

]n! @ @N@@`v^e5(prjA'N[ouo?t^!@ @ fy^{rI'r/G19//C9^,\$@ @ L\*s!@ @ @--0 @ @ @\$

^Z.r7/Y\wum`\j(HO\*5\\oqIW\_}uo~Sl~&.\*,T\_\.:J[@ @

 $z!zg|t"p^{-}+?od+o0_{bEjJ\&X]Z4mjrO3a[yYc/|a*mY}9?r-$ 

 $or GO\& \}, O'1Sl \; rRC \sim = yOXe6^* \\ K \\ 16uO | cmY^* \{.\}w/O \sim g54; 3|-_yW6| = :|F| \\ F = (F) \\ F = (F)$ 

~\_m7RZk??g=Yoo'W\{C=t}s9\_;6M9NwY

@ @IYJ3Vnu[MW[wuT{#'NX-ei^gz

 $7L'z3 > fO\&\Y9{A7^e<nml'7Z{bvjizrywicls='::f<4~C2qiM\qm|K^2\&tv:WX'zf\&zs>g|?l/{\&zA^@j]G3jOn-M!} @ C2qiM \qm|K^2\&tv:WX'zf\&zs>g|?l/{&zA^@j]G3jOn-M!} @ C2qiM \qm|K^2\&tv:WX'zf\&zs>g|?l/{&zA^@j}G3jOn-M!} @ C2qiM \qm|K^2\&tv:WX'zf\&zs>g|R'A \qm|K'A \qm|K'$ 

@s#|v&\T<;c=\*~t9g}F\_Um-jy

%xzl? &\$LJ:\_g}o)Cy#YV5T;OgDK|[s;"A1Z>7tU+xT @

 $@N@@`g|^:a85p?h;?=$\#G{Q;Q\QF(FmHV\Iwef^QI[*?Cr=Web$ 

 $1K2t9w \ @ \ @, IyVGy + \ Qz[I. < (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ @, IyVGy + \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ\&o, \&\_IXJeX \ (0'|r \ 0m\_ElP^{\ end{tabular}} cvd6NKFXuQ \ (0'|r \ 0m$ 

 $sJ\&1N(o|\_\sim=awh|N\_|;\_\&55zSuda\&*N||Vdyo\sim[w"#c\%UYN|eO\simCkwK\&BIdh @ @|yJ>{Wt8 l:}$ 

 $l\&=lD\#o?['mn3_b~Y''L:W:^=~u\#h\7q\'yuOoG>2|1L~N)?5\&^WMda_D\&?n^`nL^j''a8/~agamma and agamma agamma and agamma agamma and$ 

 $T8 \ C5wgL9FO > C(/~f^nk\&G1mR.h''/j=^@dG \ @$ 

 $@NHZm|i(\%Ma3R7\#[O]p[$=Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oa%s]nVYF}]) = (10)$ 

@ ,1q+s-%JK\_Zi8lb/Yd\$G=jpJwa[.`u~K.\$M:3bo]z#Gv}+m{=+u7]0d7/ 8<)Ocd3OwJiHZr'\_z&7=I1|\_\_<o~mf+% J=>X}wn5 @ @uaE>cmo{U+-[s5{Y^.#3pF}XwK\$L]

 $mwMoZ#e^{N?jE/j}7xy/W^y^* \sim V \{E7Z'N > l$ 

]

 $V <= mu < \5 @ @ < eZiZO:zpvXEu6~6gXiR v-5+e]lmm?$ 

 $R{/'gg{<=}F{>}3Z;nwk{=}Dqz{+} @ @VY^PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y&k{+}k'u[n9uRSZ{=} @ PVY^PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y&k{+}k'u[n9uRSZ{=} @ PVY^PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y&k{+}k'u[n9uRSZ{=} @ PVY^PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y&k{+}k'u[n9uRSZ{=} @ PVY^PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y&k{+}k'u[n9uRSZ{=} @ PVY^PUNsM{[.'/lt2gNK/t7aLw4VM{<}le{\sim}ihzpWM{=}Y&k{+}k'u[n9uRSZ{=} @ PVY^PUNsM{[.'/lt2gNK/t7aLw4VM{]}} PVNsM{[.'/lt2gNK/t7aLw4VM{]}} PVNsM{[.'/lt2gNK/t7AVM{]}} PVNsM{[.'/lt2gNK/t7AVM{]}} PVNsM{[.'/lt2gNK/t7AVM{]}} PVNsM{[.'/lt2gNK/t7AVM{]}} PVNsM{[.'/lt2gNK/t7AVM{]}} PVNsM{[.'/lt2gNK/t7AVM{]}} PVNsM{[.'/lt2gNK/t7AVM{]}} P$ 

 $@*n?Xm\%)D+-m\%3-I\ fr2oi2wlqkt|$v;K0gK:g\%?,MN>3]t](Z{ramC\%w6dr\%pG?$niMQ} @ @f$ 

tw]:dsi8W\1\_|g9V9W`R ::.{+m8g/2xqfN3} xdJbJ<1M`N @ @V]@@`w^7((ML O~d=P[h)M

oxCy; os#,lAs<dM?C9/yy> @ @,`yim}3&E`L5nunn+9zU.'A;d~x'=<o); @ @Ysv[

gYs2lZM&kj3j<yw&zV{`

 $7lml\&UVH\c+M6\Y\% kG?Z\<rFmQKVv6xJ:O;|SCp !yH9S[1 @ @$ 

t\*UM7;ynvR[oc)\_W),orOY3; LxdfV[cLTs=oZ^u]oo}>3N:/iGqDy~fmPdN2iB @ 0;^k5

?%w|3);v+0{ ii=f4

7.|+[I

t9T%6\_IZ?^sWM<qDi

/ @ @:0@sw{Zt4Z.h/zY6oBi::x/46.#8Xxoh5wnu.\bE3^]Fm-( @

 $@s[\{.w)[mz,mL:Cwi:J,G=jhS\&_,La\%am\{KYAJ\}N6\}\&u,OC?4Uw\r-O>> @ @k38y:?^[gLK:LLLTj\s]rA\{mx^VnY7'Eewn6|^Q!?tfy=>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0/|/$ 

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6O.e < r' \sim |Zw <) {})7y5epq gN Gy^T_ \sim +NwZ1 > sLwh + muh | < n \sim mz9v[i|m[jLyX = NwZ1 + N
```

@ @M@@`nnVI{c=v)Wzs\*zlS\_\$Mmnsrc&=S,||OKFN+iw[``~Z7q7/|yX9I'4lpeo=[~T|y?% 'PJ@fN~6t}' }uOovaYgU<o[|4d29tvn--[GY<zGn= @ @@

 $vYE:|\sUCxFySZ2^zky;YvmHtT/3wu\&Ib:o6myTZ+u9\&6)9udCh_|X9_3|\&'w'okL7)@\%/2\%IQR=rm2yt:k^)u8; wN;mr/~\%[mxp+g]^W63nt[2:U|nIvr-g[tnMys'< S>% @$ 

@^gJN[l\46,nm:FNzRbwko]2qnFOw9:>:>]Y|yIt(&\_yrn>mn55H{hsFOg6`M6i.hF\$\*8N\$BSz= Q E: @&"E

 $\label{eq:action} AE"BMHH ';?{fgw~;39EyI5nY\%8Ju70dPH`QXZc5Bkb4)TN+{/K'G)u?/`'tRZ;CsMkD4_~YjtQPX{mw.6sT+J $80=} < WPpW>8a[DKo=EM $$ 

3nG@@@@@8V?p;c

```
 \{Pc[5Kv[yiv3TRks\%mT(B*hBw(ZTR!vRkykn5y4VZN fZhG]vY>QP`@zZ-"'4Q0`Ev ``{i<}P;g-FI}e: Zr.RSjK.k_=OU_+r)_(wPW?I/E{I3B6|*miRI {BR:hNRltn;fgT~9"*+10):O}+(&8H 6Y{Q_=Pw9PR0TR/(A~^t^n|HW\1ZNA a\b:m[l=saZVmm c,'iYJEIc8? K-TrHRTn -]&[oSO=#yCW^ c>3585R>*MZGA>wP, |Ks/laBw0_ME .w!.>4h^]`pvJYg[iL%me{PXc.T]*i\h@S](ja<Rt;y9MJ*QR Pz
```

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<sup>2</sup>ZCT[Q=!.Muz{nruo-Lve\uJV&yIcPpX/RXo*4z@@@@VA?zFes <*A:["PoV;@*V@fRt*W!
*K}k`SD_wuk1ITtH^-0y LwE [n)D2lVmYE5)sujM}k\{LOsZdk@@@@hk"5)yg{R 12cW
:uj]wfm@@@@jC@m'r$O7u3|dZ9O
zEx$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P*N'Y7Zf{w5XXb
{oIr/lxD@@@:I@c
hZ\pA\{B
6@@@@]B@]tn931e!v}h (@@yFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9;G
u-z'O.: z@IDAT c$ !@o\p2X@@@@@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@@jS@m7r @E*ba
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@@jS@m7r @E*ba@@@@@@jS@m7r @E*ba
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   @E*ba@@@@@jS@m7r
@E*Z(Sfmz+!P/|K[x@@@@ P![1fKPnNuj={(eD@@@@\,Ll3ljx|^'(_]
3WTF@@@@eCee@Vw]pe4K@A$]?t]"! @45S&&V)6[@Q
*]g$@@@@hVF@+^V%IR +# Itknk--x A@g8mpVm
wxuB@@@@TM@L2FQB@@@R@[j/hve<v}ogY=8v@@@@9
P'|j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p)
+XzZ6XsHqbu'loMkpMR?N}*va{g
?r?S^x4`mlm;3OrG;tm{}[o=klWc9&w]&" waj+mq|8{L,/&|]rO7:d
a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:l7'Mb7D/o=Tgm_nMc x9~;,h
U3Jn]w7N<Dqme-
f" i%|e0SL{cL_v% B-XSO?Wsy^=Ozal-6cL{k!msfwa;}z^z=[av>=dwf/|GvAJY3%\wUW]f#<br/>b
kG~slZq9~?),6}l{U>=*KH^{$S
i?~A5@YnP6l!k?t; C![[dw8^5W6zSgnZ:d:D?iQDUi^}{]Z}QgTj^v[?/"Ya2 @F
y)0k,eBJk(B0@BIvwt'z6lM'w)2xp2{=vW}xnw^=bU/"V^iE;h{)i/p-"N;-
n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v_?m2`g4)yo-370"~|m_
Ao{We_IR~e<5>|Vif/cv4
0
V @@LD6>c=Ca_{[^@?_8].+ PtOXf
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'Ndl%QG
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@}ajoI>x^e~_~n7:{1A0 J`
[K<t"
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{/T>)7L1(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[|!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
FZO5 \sim z, {!m:^B > Dz^}&+pIZom[[n^hwy]qo @i}NW]?vGrV?~vZkfg5x}nz\`=
4h5ao-L(QyOx]I*}q^KcQ=cvL?w}hvtV:&e/c^1N}-PF!~zcOJ
<y?9zva9a-g<yX@@@:._|1rnvRK-
wv%4j{GwL>9K_6X}U/i?>sBj1UV^;a'n]sy7nc6pz7YO?,<_!Plz?D>[vi_/z@>`+Z=3a
\{CG:b\}|U>Z
E&7VZfnlGkXVXasI@@@@@Z3<4HjL_zoTZ78oGr=$N,z2j!I}f?v'Bv~
A?dv}oNBd~9OnnSjg]_y]o)j)rQjuuu>a
:JM0!~%Ez?LV9Tjm
ue_*T:@,6@7mz}G==&~r8:LO`cv{<>y0
@@@@#DRfi^[6|}WvAs{7dy|5iQ)it0 L*=^|"R:`G}O6y]u
6;;U[n|m<8y<92o{(c+.:cmZOLmD{I=Pj\8%g'.'L;x5@*Z=/i<wx)
D2p<W>~{1z$]`Y/tLyIaoHarmWxS?g^{5l~Uw/2NIapxWLOG=a7yx^P&NXb]=.5>nLS!$xjv#S_x*\-
~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@
.RE]zC(:?;C|Ja'5
Tdu,^qufh}eAG/8iV6q<{Ly =_4i3lvlsYMSv[OSpbx0`9:G@@@:r_|q{KM^Bljx;uUWY
1
klOIOWd!'Zn.P`_^z{H;l6FN9j*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5:
H:196
oz;k/= fm/
?|;r1Tk,.8!Mnu` {6*|:Gq4p77m?N[>TbK$!
5W{Wg4( r~ s:a~~=j5RJPo]/ol` ?Yn64@@@@H<#1
6(N;[1Am9n5GW\%\< y/]{i>Pemj![{5'}@]tAjS~9_lQw8{?.IS@`u[=9cg~gA5"><XMVy}{}
4&Iw_]gWqa@@@@|.57kv }+N>;^)7?{F^d;mo}mZa_FJ<RxF5d^0Hp26+[.oZT`Bc(-
```

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Bv{CRK_~5oZ[#?yzeIv}tw?m?z~<dv=oI
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q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG

 $dZa>d_{11Hx};+c((G)|lN.]^{200}|yU^{uh3lLe}|_{6=tma}$ 

 $\label{eq:source} 350M\{Dz])]zi6), [50WWWgG@;=Id@@@vwJs~vM6B=3f'H\}9\$` yyOx9qo-3g\}I\}8->nj\{\%^Kzn4_sXfUW\}p6eT Q??aw!<cvo^qA$ 

&2`x \*a}A%+fut)Sk\*wMSO?k8&;{Wpgz]"2

;{fwujK

0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B

```
v?5)yzO'K.}cCWEWTm>xm;'f7[o{eYO>b;#5Gy7J]5xO<Smo%kCoeg{otOfW}a*/MzuAX:B`X
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>I

Bww/k\_<yd]

8~`^

;dImJw]t9)b}

|CB@@@:@N!wg

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7bSL52PRp`E(Li}N_w-[1N;l|b&K?W_fW\}!`jC~dkzzs}|rG}vp+:o5
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B +f TBY;)s}0qfO?y?5q;}<
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}-Zj_mn!<a7x8fc7fr7hn6xE[j~_vmXqW^/_z4*jgybO
```

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@#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8*_@V,<('zuYO>uX:=:~
z|Em
f^v!}Wl5-oz-c~@@@@@PK5!0mt+U$ZR@c+.^R\nO_]+
6grsRg~l=9n2]w~zK.wo_|%g& @C
=xL3f~S`jS-(0gNBg
~[*;*hV?}]uUvGZy@`!w]r% @@@mJnkw-
EMBt=RYKm;ng!#hx8v&{)b]tQ;A@@@jCqj"2KA5q}&cWAjiu4n8O-(Gd@@@-
u}nOaEK.wheUW.d@@@@ZrL^
mcKuMO/:d ] Ikh@@@@ 21%% l:H.]-L4fZ@@@@@zR;I <<g f_ #" R }! 0#xv
  @[
hKm < 0- m)-w@3g{gZ*J'}
'@<U%[|gmQUiW_}v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s}4Fe_|E>}t9ri[IT@|Y=chY @@,e1 Xr%m!vwyvg
Do/x;umege>[j_~e]P(7hkYf0`@c=>h@N8[uUme]\pAp
onr}o!zvXb ;*8;`&
 @ h1J6;w}>3SO>92R{~Bc
6~8t-n}Ut
7c~gFzg}-{=DZo=cjvA/l.]Vwu%?og[m]|9sBO?pvGy/byZh}GU\`+Bhu~KCv :Z"m*s=8~H;Sa
@TSr-]ae7?dwjj^hD=M@[
uQT{K?O]ZO%5ZkFKZ'W*W@U
@>6zhIl sN U:w}s
-qy4@@ :lhSp'W_U6R=mmbKZLw]H7B}?tv5K qA5cu?vu u?
@SN 4(7n.O
z0;C=44A]s9^+h3iZ@@M sk&YD&%jCYeY9n.(gbsP]5y*g\gq?ymqc M6-LVAL^iim}yS5Y2y
*{HclJ5PkGkAD5Joj-w>~jj\N>9Oq?X5M%+/<ukM{@amu}gCD:AIg%0lZyD@hmvqEFR9?~.0
zmkxr^xoBmC-B[}~{[$ j/}.]qsOY;ZW#AF1"f7h#>|xnbMl\n'|GCrHJDji@I>T?y]Ue=OBM[.j;%/Ew94vxM|09F5!
kW}?Gy$L[q2,X+i`^E[o;t?O@C]4mnv,H%vum/Gu{B18*9$C{7]OU|\)O!?ePUrK\~T&et{#}9U@H]E6o_>VsxyJY
mdkjZx?-RW \sim .IrwU^*
O[Y^(4Ht[D.(K['xK^~U;|7}oVZkJN}GmW_m|vBs{ :nn?7f;cm%wS6jtF]KU{
D5ur-*M{X`J'4fKhneJyuS,k~6-
qt@@V^Uc>.y<wNy!A^?|#q{9^pSGmJ/'_uXP&/L?^SXr1zt/n^dyx)y@:y<wm?<^xh_}m4_:Y?Oe|2i0O/O06Wj&`
Gqn+hy^ QtwC?>fonKn}
vR|q
^s><pk2^Y0?^OG~<`,.
m^:o}|\/>Cy,{ :-
vE1_G~/qu,(:lkPi-<U<@|'__t [{Y
sZl!,@@Z @MJo?T0J4?*&i6T(
mAo^ky,,,a#G
a*8zAS@ATA? 1it+^S+//
U}9[o1Gp6B@@%
G6|p^-
(((}?W~kg&}pj9?UWA
K)k
Ztczt@@[o
i^5sy~A1WPXHG[01.0YSO=5 :jyW4?^3viI*I'ul>:~6kHeWsN??nlT_|Q60!"x./1+a[)lk-U-
BC!}<]OTWTX&yn5/~M>VFtR5&dy
>U^{T}t^{+!}f^{+!}kk(h^{+})
```

Z O~UNwQY/z0O9jV(\*xkY;\$SeXiDi,W<VP#T!@-uXC"NS@jA}2}~y/ Wqe?la7uT+Dt}1TAV@@J@U|keK5`@4T0G I5CR?TQ?IyajekY>#w^&}dw9F~.pRLLJ{P yP!NP\*k%H\*+2YmvvG?QBtE\~XF5)m y: P1}%

```
?f
```

LLt8j\*EzX\* +jSkG~xXF\*TT9{

RqB6.)h]zmI0k\*WtRpLt

8Ic5OIRX|e-XnBtJBdige

j{Nj>tN^@TQ-3[VoguywwlAZi=]]Ae\_-T3\$\_3i

<SK;#-"

\*x>SVyT`Wl0/"`V^T@#~ZqItT @//\*ubqjA<j>sux ZCm]1?-%T@Sb7KtRK.lXNhH6 =+@,

 $0N4\bWHyv_Tl!o<N=9_A\%..P$ 

lb)v{6X\$"ps^

LN-jeTN%\*W,pZ5g\*e@s6+{Q7/U5eky}P5UV:+BN:(X.{#}>%T@IDATUT?}S`

n\_nrIT8KR-W{>c95z:PQ: Pebk}e;-quUl>VEreQdZ/RtTs

3WXy<X\>T|"@\&vV"Rs:'\*Uk:Czy#

7xRyuG<>Zpa4AR5Pbj0/Bym0I

/yM0^{5~0Ii91^\$y<Kfx!rJlyuM5=&iZK^`e

N#n: 5?A5bMu\$x@|r's^<ws41ymq-

```
@#,}5t:\A`$yO/9'}y}'W"=0{/M/_5]z(G`z%81,Mk%uBd{tUBUM8i<`j?[\zaya5jTk^Av=nVrz*i&O@0L:~Yg'D{5}]
@JZ?({YpIU*uOoy4Xwf{-+%]1QvJY[k03:}%?<A<2pYzyZmP
```

Yq}\$c\$, t& 9fgyuox|SAw`

}|R@`o^@Di]%-T|]7SA[ytOb)oui

 $#5Ov)b^{Uf} > 1. Ftij@5+{w} -b|L oIm^{z&a-H-[}$ 

RI(Z]IB]\*|'3uZk>J3c!hv-u.CA

CRhV[^a

UV[U`4lS [X Fm'7z?o[Y5uy\$l,>A]0]1]cz]83QR7]'VGJ,UgZr\*xlL\*Z?{\*lyzc9p=\,^'9^ '@@l;{pL\*oN|4Q?baK\i ^P

 $n+x+j\&{sk}$ 

-y,lk7j25j% 30k\:,iU)Mc-8/c1mfNKi[[;^~`>Lt-LS+&PTcZ,g)Jw[yUzn@@ZF@8vRN`r%^?Mct~

UXG7jzeRJPozxS;vj']xnTUR)[LRjW9Z[{8:@nBZu bMP+>Cjv^K.Osi1n\*Smuu'

T`Z\_sBM:5T?//S=unOx3jsg6Z]x SoguU5Wxph+v-Uy,\*'.W}){/)B+ZkPV-^

+u#:4Ku%@JM0uZO2k1iC@h!-6:CKugbUwJUit^jGTV

?5WI,tJ/~Pj^g^=WJ|mV>mWd {^[Knj;S /

```
)+@ ZO}n&EsV,-xU[ryFR6]N-q-B}O1\Smwx8G]qEYbKKu/-v'8Fj6,|>t=P
```

46{ijn\_'nC="b8Jm@ZSu>xq)o1=MK"JVh &\$1%6?}iE](vTTJ4DkGl\$5\*" T/M".RCI?c\_1], C@JN1NB

+ETT1J\*XzsI\_,~J>Td1cnM4KV\R[K9P[om\_|q{PQK)ET9}tVYWX=g'i\*XH+v\_01R+t

```
(w)8~m_<frv2)@R6tnZU2@-I~29{&kjm~[>jrP=7MSkH>~|S]|_)3Z(mVs)
```

 $Op2/)^Z6)P{$ 

U))'Upm"m?u{Gj!nG@@ 6b/PQM'TYk?b5[8PPMVYoyI?TIM45c6qcH??q(hR3XRIkT.dXhzQGE]LdF >uE%u]:>JB

E[K5+?SC![W#|h,=\$/g}T0r(oRb7"sn^}0k^^TMn<0<!kU

\*T!

 $65(R,/j?:/F0+QAz]FsQz?eUVm@'+~~[>:S7vO}?{b8?>*>GRR!*.%]$ 

SUZ{^t.)K\zhx/k6Rk)^JZr=9wX}olx/Vj5.QwI~,BC1@@uKbUi#uAY+2mkN>`#e`5^),?

```
^h iK\d9T7'Z?L/(N5#?{wAV
|[Bd}b)YW>9#x?f<PQBdlyYxa/(xMXfis0Y k57O@s
{|SR>dW\qE2drD/,y02rA0k+:&o_`S?mb,x/hkm[4 ^c2Y],eGe:?}Lo
9>F8s/lpz<=Fu}`7Z_TJux/yk[9kswWO^{IEljW/p.xkl^^{gB^u|<dk
Rr2V^{\}[3] Rr2V
k;)~hc-u2@@VPWU%U*~XO5^t
Y}EmNlq~/xdy?KC5mz
^{*vy`7bNuBio|*H
YGiubA^:Z@@
&)`
TBXpk10>P#nC@5?}ULZ}Vw,\PSTn@Nm-We^Zk`{zh/7l5n*4l^Rt\fM7[$L+UXX9Zss>py(Hup[$LS`)~e\mx
>r+~[>+
`i*yY
*LsHeT}HjIb=.pW9UCA6J;-
Uo[y6dHjz
:L
f+!Ts
* '=C2B'W5Yz:k[W~S :d<A@huNvNOjG~x#ED|0PN5IA,hPxz5i* 7T&ov]b B=s85Z13!](S-t~
bmOA
XG~pQA9|`vCh!Ki*85UEK@@kpo2"#`5G|K%.RxI(,VM/7 Y?#
*W!ZQK9'q[i
[; MZgTTy*z,{J?
h?-sSjkQz%JXJ*SIr\ONA]|&_Wog]!}V5]WK=
rV>JF5U9#+}7PAZ6{$ <<}GL S
E*.%PKU(J+FZ-[5
+gyfA!Jt/wtTQlmRN><Fc @f1~b+y]SYRvp@-?*Zi7
(f{MzB av46P?-_uVzygfiqyY[OZ{[E}*+/zj M/D
w}5jW'~
/iZC^(jt.#'K4,m|.rQqjA_|?mSya^=}Bx
 V4 \rightarrow WyT{
sKcoI+Nnw<WPg \@;?Ad(xDcj[
Ι
d`Wz59J@@@"[@>=
t6J> 5,@@OYG@@@@@\UXZD@?n
@O=g!
5!pqj"d@uh!l@@@@@v!@@]2
   (a)
hl
           @ .N@@@@@@uy 8y*LC@@@~>uG(@@.@@@@@X:h@@@@@
D@@@@@;u>9@@@@@f0@@@@@%@@cO@@@@@\,LD@@@@@c XA@@@@@
W@.@@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\.LD@@@@@c
XA@@@@@W@.@@@@X:h@@@@@
D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\,LD@@@@@c tX:5k^E>jDKK.{X#& kffigv!
R]puz.E&@@@@e|aOasjz7|0d=
We @`vj'jksUNDHI/ 4_@X3%krk
```

```
qiituFB@@@@ hke4 "eUt])
```

```
2 T@'=- !YKo! t`hpY'$@@@@Z@l:)Sly[Q\("`{^cb4Fc7Xb4j5*1{
```

```
o\} > n\{9sJw \sim s \land @ @hIZ6,7 | \ sMIM0^{m;m\%s3@} @ *!/?Ywt \ 44' \#GonF9n7\&O-B\}: TU = nu \sim b \sim tV[m5Kk*@] \ (m5Kk*@) \ (m
```

 $@F{<}Os6sAwn{\sim}u\_|$ 

 $f,W\_U\#\}lCW\}d=eT\{mUW)$ 

 $_{y*/\&L\&}tu{G|9^[/]ofIvR:gxWW''{2u5c'7n7}~7'&y28ze]Oa'oN)y:$7N9~m%(Y @ @ )$ 

 $\label{eq:stars} 6Xz\%O\|\%WK+wg."mE)wV/wcN1c; [ljKlSNg\{GahpY,'G`_k=wm^;vYc;nuzG>hDr2+?f^*,4`A7l`/^|U\{C_Fmwf^*Z,OwREr\}$ 

@ P"`Hn\_M'FF!4/-~fk[z=sM6 O?1W. #c{3nrMk:W,:imQK+>}7c

```
\label{eq:gsoP^}; bAZ83l^fdM:_Vzu\$->lC@RWFn=1\$mFWn]bL:+=v]|O8`4>V2; E0O7xh7Q[=pr]M\#"o_L/]fqe|4;1q3,Q?; \\ @ @@.Rs)S_=g1B+ehv's8k:rhv} \ `XbvdkzXm,>9<1gO[neMkLnqrH!Fgz3/?g-\$=Sox?g=c@\'7|!iR vXo4Oyztz,jg p ] \\ P = (1-1)^{-1} (1-1)^{
```

```
% @ @ C l'O.mbk?j~1[]eEZkVlgE'}aOd\^6X]F~q8blVnNkWJ+X>tV>}"wM6J+r#({|mtvXt eYA^9 gEXw8V<
```

W]?z{7A@.c.{AnL8#uos

3f@u\*vqGa`L

```
oEX_j!r$QP<Q!Y>\%]V.s|oqnTpj}Z/Cj{j`I,|\&@1/+at?>.TR:{g~h2>FI^{4};Bf=-}}
```

}7[{lm-g7@ @ 9?v/

`/=!#GwAIy^juW7rF\*CW\_XO?\_ynyr'V\a9[

```
)p!o_oq3w)oy@`/CROCYy?7.g o$l]:n{.N$k,]}t6+wYc?QvE}9
```

 $7K\cfuq1@:?^&Y:@@0E2>lS(|Dmf-C\{n\{\&xN;l?)Zx'crv\v9T?fg~j|m1^{a}\evn+ymNu\%(AgmpD_{a})=0.5\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmrs_{a}\cmr$ 

 $36|m] < F \sim |I.e|f$ 

hE-Dn\$|-{|nZCnc

```
45 < v Pw'\&f(iD) 3nv[AT] g.Wd8LO_/AYv?AM+B @ @@@#jLi6,z< 7v > \sim
```

ME-~`1\_K L=\_

```
r{NwE$9^ggoW]{wv,[nV^x1a;I5fhkXnNvYl<c'~igy}i<~=8p^19SK>j?pXuI
```

d

```
Wbm<_*j<w)
```

```
@ @H/\[=q,K?+jqy~{s~a{mL+?}yJgg*K<{lK}w!w~4$]q}I
```

1p5IO+>>

```
{k^H,T$fq Gzn=D
```

```
:i!vP=13)7lUWnXc.M29LWml+VhG%" @
'j:t`<~ZG+SO>mtvz)XZ<Gl^z\d?=0mz2RK{zy~l&Ct^\WC~t.<(5L+e(& Yxbek/rMkq2dHR-
zd9]=bl9+gd?n6S1@Xq32_v~@ 8dA @
r$z,)8>{'mQvHb9c(D1bd\mtSU`WIpNr3Okqm.=}a{kdrK\b`[z:7`nW;ej;.<n-Yb%o:Im
KluxvRQD=L]]T~[g'E\:>P9s1"|28< @ @vsoBs~
64C-)Ss7\&4Q;6[Y]781c}y[]py;]iEUsO[vI^\Oy6,"CM2:V]eU;o;roE.l'tMJZkPg)k7_F`FNy9jzW2|}{+{Ci
?.F'_Ly{["1utyAIUD1Z*u)0B @ )QYh
W|O?.GsB[zi
```

=

```
_Am.?.t^x
```

```
l[:cO-f]v/ecgWO<&}dW3O0"aX>XmOlukzy]Ng+vyg6(:kd
@ %P_;en>2/6q$,AaPqz?\/;FGG`g7LK/5/+^`H1A#[v7VV[ehzd]tL+-~Ps{3t5RX F\]f;`>c'xM<
\kKjlYbo}8Bh6
KvveXbX[Y]:l00z:wV^G/[~[*]WPg=4>C k/)@ @ 8yGU:G~ReA?ZK4i{}
Hh}'b/|.ju+40k>o> 5z3lK)h{6WV49wp@V[9J[m*,
X &/7n3M
s%
x7mW3k{9@ @`.'>e.> 0CVAVS=A? x^xV }MU({DfIOL#vip&O,{iwygX~,!@
'AeP12Cs<'lo~:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @
P>+J 0A`F0
tJ&k. cDYsb<}gq#Gc^;hom '`rH-C @ @`&9+F 9sf[h*u%YShB-dmUWz>4/npX@ @
0C}6z{QiAmIk3"%\2=ztLb^~e[fePh
@ @h_!Wnm.CKJJ3-OXn~1@Z+c@ @ 3@]lA+7/<411"-a[@ @ Rv4M|5>,AwH1j&hBFW @ @ ("@%eTw% @
@@mC6\ @ @ `hS@ @ @jC@mR+ @ @ @M N @ @ pV@ @ @@"AM@ @ @
J @ @ 6Ecj
SN>c/xk#M @ @";"f<c^b7tvU'v:\sMr!!
HhOqL28&2,3xZkm8}z8hI{3?O<>#S]!~
>E @m"@M& CAl;lG}}&O>".ZN<puYUXjO?h-M0
mUW=z!Coo=?hV'l+7|KX=mu?O.0m4lwv)Ur
RKnhzk @hYZ7G P}&O?]c
+A):AYeo04g'Md7p5vu:.\,x7_lakUANv[xfcvj/f
yA.}1=z?o3aAg}<@O~ ~~nfs8P~x~~VPN)@&M !9lwuQvu,HMstM+qJd.M`a7ki+r8ZUI@% s1-T[)x
ifw}F?a\3*/Orxw]v%rUWAUVYV_}u+!<843SN 221/0d:I
@cKZz]}FKtb[ou5k1C[-!-Ac<c\m6@ |IF#n`r#?
HYN;-VmK/
^7zrDq
;`Ljo[g0)Lr
@@`ji`A8XZs7WjA}~\)NjUsr:[Dmc47Hk"5Mkuk2yu&>yELX{Jk7We5hnLyn~j/frYykP#$r_"{ayrkGqGdc
?|pK-$b(*_;w T:H@}@ 0.v{~gb,|rqEgRu=LU>rK?hWKz;\"L-]Nb}lJ#V,MV=ck bX`kv3<[,se^xrUu1c$|C=4ur
&I'|/j{)K.d14M<wqWG_z(!
|G[nPFuh_{<wWLZ:'pz>o
#FZ. ?m.F_r%E'o_d'w
с
's9IR9K(F_>k[
$)$>'NF_XRF
r'RnQJBr
m^{z}(fmVyYi)v[X4F2~E3@.h]%gk<~wIL+w2<(A/!)
@% d
8qB8>
XN5!*o?+sr)u,WzU}2I+L\o
J6ktW+
pМ
d[B>y G]tWGYpe*|wmW\'e+I
A^W&Jd;/oW|t[AH]!Qp:b-Vt_Vjo}&[BNt6]pe78FcG;DI3r#L:
qh
```

```
bqeJIDl(xPX<Y}
+B{y,]vi}-x^{\wedge}
!O?Jt
nNK1 = y+6'Yy XpCW < H
r}*nMzT^ 1
n*.8^(*)tg
/g+=\{:=)K;bRS'':VZ^AA^..c
tcB:vcDtB9chY]@h:|UA*|no=cJ)(i)v!!>)(D-A?){VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt\#A)}
RxKP\% #>>pDeg[Q?[XxC0|tfY]r:?_4-Y2H6i[n 4Z-r''E(H^2xe)]
"-jo1.o]tAA gbSFK)GNm:=nhpetyFF))$O
z > 0SLh/i > +Q > K3
>C>o)+U_5RF`13txMV<VF*d|I_NQ'm4ln^zGO'[%O@Lu5$e{Yi:?jM 2(A_K>}y!VyvhPu
\{\%\ 8hDK\ s22\ dE\ s.>\ k=+>c1ylVxiL9RA
>{{c-@-C@p(#Rj'c@v%l3Fh>$@KCFeUg$@fyGw9(#welvBYI#FwVIL+D&F)qJ`R?ofKKwI~/bZAe41-
iR7JA%ig7[M$e#)Db%-jw{,_vRdFSGRrRjU*w?<kx8\J6.6Kf&KiqLyzj)gV4:Vy:NZJs7Rve
^\>=1h4C2YU&{Nq6+i#f'R*XRg<OVQYkOn>TeTVA@2y:Wy
<o&C43m11
*.|VmbYJPKnkPh/6SL<&i<3.
hZbr
]OvI|F76CM'AB)7U
sg\VOk>7bH\aei?Js% }Z5e>Xb='|rHQ }w+
WPJP{$a=15JUn;sClv:17ee v\;ZL}tGR@Rq%&5uxxl[>64P7{,dEA+e,o_z|C~Z"OZS9'?TB,E
I@lmL1T|U<Yc5WGmsXD+%{>E~R{QuU{.c]b3}<m}
0/BZ'|E"?kw<R^Sz?]"b03a[tgEB3(2?Yb&g+pmkPD.]N=j*6G
a#45WuJtVs
Q'UoHc7xKT|#)i>!HG
F$g
@ rj>[I?ALuJ|SLnAGCtN)|~:
,@1?i%d+Pc.O\J#KbPrM"B4(P]{wA@J<VWL*b1bUMEH^Vz9}L+*ilcz%vw71x*Rj,f~^9W
(R]d$4]k.
U8O:1e Mkz^K.#+<#=x>3^\*JsS/V)#$[neXAJ3iV*3 2k~VDKFz* V5W[IgR|RoYvs<;];]R,b\Vs
FzG7:u mQ|F4dps[=>|R/)Yg @u4: @8saTjS<bd!S(wR/+^Yi|^"RI$MEmM7-V,(Ug,_`
3yNZ .)#'vk
IXez2I
fIA^l"wWE c%zsneKKY0*W[kRu]4*V3)RifDAJOhwwr aj-Q
{iRKlwGf2`DQz)@[X+AVK=K#m<B0z1{?ok~&=w?4'}mSF{}W
z[nLxR3QRyK%|Rl-qVf,>-</Oc&Y")S,;\!1N|@ 0CzsM
6Re>d}$*[bi
1?7u)C}q;SW/Hr;rj/uFi/}N%~V)%Rhr$w@>f'gf/Jk)TZji[dA0RO>&t)t)2$no8F8=OYxIK
}RL[vM|8;aEfhFPctTjv@{%qFAZh\0Um"/!>8;#Ul3Q*y3bCwZwT`|W?R3S
w.tv8s1A!O%ai`tAKm!af@'MA9S
@3*6W]ItTiEzcz &4)=p'lthVrFii$TkITJt(V$-9aLzHx97Fjrz4hk7v/e/r^dYjk[orUJK *A@Ne zd6~@6kbc:Ck]
XE/[9)tE\Ri4W=A2hFgd,(H%~KLOV#Eat-ER{b>XOzvFjoPR5>iGs6UWrnp]eReJ
fehK$D3oKQlC -)FIIRYGCEHiMOeT~)N)]^@Tiu[Cs7^7WUso;M]4{G2DjdF@
iFvtlQzk^=J[ySsmK3J\hwFPG+8v[n)t,?bsK)^=1"dMO|N]AQ
r%|1OOn4G8s-51g5BA6H>c<8{ td24H'NSRB3tMISA[.z)r#KP^W+@b
=dtA @Z.Z:zZ%CSE>RI4"?-
```

r'!ED1R)+"]\*EDJu)

EEs1--v B-!9QR4u~Wl{Jo7}rK,>bF=xx)Ys.Qr"0--=-bAnWt\_#74 W=

 $\label{eq:h1} H1j>k6dD5pGnnn(^{34}+zg^pIr\&k,n*osT~h$10pWbR7rMqRBhDJnqF3ed(3L{`=wry}.yaQ^7)s'u4k!@@%0TBm.GGVY%F_}guVU}UG6-O1tiyeijkpKhOgzR?H54O-WJX.*QR}(R`RGAu-$ 

"^krk7`\r~1=;.P<}\$R]/]T"s+,Iy"cFrK:lC>mV

K,SJIV-

%`Rl\*(\$\*FW{QlsH^}`5B'2"AZQYX+m0@Ky^V[l.I2[W{gn1(,\*'~kKzvJgeiy>LsK|fP5xa{IkfKUw+]C5iV~w~\_gE Y,\*-Rm;Flt{5;C 4HJFZ+djq,P}

 $[lE?^{>:}W"$Nr2/cJd]^{%?}.B() #>R9IVV^{y^{a}} cIg"qU7,(pKwK^{IrG'a}) = 0.000$ 

 $qCEJIIPXkP(ax1:>^>>i=!)j7+^{qE8}wn-$ 

 $DWrniPgN rAQ|M!2[L|[]v\g4WL < e\aze; ?S|x+B?]U+)_{\#} < PF^{:+}Ae\$, wYskg9Q$ 

 $n19YVsNtOV7?y]uO^{t1}=mvghBY\} < DRF\}Mu7\} > nXL \ Wu-rIzvONi(x3bs\} < 6w\{S^{L}\}:zJrqg|k$ 

}l)%CRV(&}N{)I\_5}vA7=tizkh /~6[RJ^DJXf

7+J)}>Gyx/Vs. )G\_'e|{^&R~kuGZzu9ro,7`B!eTR~D^\\ yb>;:~OJ,zdHdXx7;kPqCO:@\$R2gE5Y~2f1Ik\+1 -2zgJ\_H'Ly>3!nr`yX\*P

 $\label{eq:2.1} Z@".!D>\gt{Wp+M(obCA2Q/?V}W>hc}.\nBH5$'R p_k2 #u&/B)on82[|6kBMU{+r7Fa*|Q_g+AMHPZ3:K>^b!WdWREC5Dn+Cri"W4c5z&|(6GcXVAc,<?\^ls)#]UMzF)MOXd5aKrcB\o2$tt\S;Am=9^}]3gY:<7:OZy9TkJd|Ep ^\tn~[>$sN.W5%uP5>LaWfJWL!-y7z5z%R*r7~KE[ @jK`Y69O>/6h`5{tod}$ 

 $\label{eq:hardenergy} $$ H/RT" QM}XM>MFvv"eBTH)> C>d>yn), 1EoS<^:/>z6/yI'^h;N^Q)uUs.KCJHX\_n5-N2JQZ3mLfC )ib[:IRcg -y(w~KW,'N 3#v82F6NOpv(.Hc K}#z/W~jA<all!]Wkq+}WcS' LH : NIi& 0L(QD2dUUw[3wt^B m$@m@6@@']D.@@h9m2@@@@`9b@@@h}js@PC $$$ 

@ @ @h\*M%Fy#8@ @ @.\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J @

XM5@ @ @@

0Cp @ @ V`h+gv@ @ @jH@

R5 @ @ @ V @ @ j@ @ @@[!A @ @ @!5K @ @ B@[9 @ @ PCj!@ @ @mr&h @ @ @0.UC @ @ mL@ @ @@

`!\@@@@PCT

@ @ @h+03A; @ @ @5\$Ap @ @ V?&dIENDB`Screenshot 2024-08-20 at 6.00.11/ PM.pngimage/png9 A<J

EnUsI)-V{!77

 $4y\_substg1.0\_370E001F*Z\_substg1.0\_371D0102*[\_substg1.0\_3A0C001F* \_substg1.0\_80020102*U$ 

!"#\$%&'()\*-./10PNG

### IHDRpQsRGBgAMAa pHYs%%IR\$UIDATx^xUOH5

( bG{/XQEA:H&#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a\_010 aL`0`ca0/d8')QO\w ,,!%;5.Q'{R4om ]sn\$&&%gRtiZ]v'RJ5"e S"7+e]{HHH7hRZ51xYF9a7 L(9cwhz),,,2 'Tr97N<) 2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\,Br[18x'5"31\$3cr

```
SR\%19 uEE:QEtJJJ= sm~*zn7sQ~6L /
6u]'III~M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G) ~z<0 U`>z.Ai0d%C~$2gMC9ey'oV+V
uU=OnfmB><32o<ZQ1+W?:WwG:7\Ciy7U;:u^[YT,/hocQF,k']R8/+=H3bDys<5_'#@.x6vcw'JxG>kNm_,/+H
>a8IH<m$Y%Av8]{`W^&L# n-vqq,ID4R
8VYnX1+~)yJz;Hmw>(cueaE0^/BCJa)hBK"""Te)re^z*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF$.]5/_^/.S#/"|N=zB
&Du
7H^]xzu3DK/Tvu$$I`RbE];oms F}D5kB{9MAL ;|cCoQ/I*U[R*I}D!GSw,<yS>{85.%$cc;#u[z,uNPy
iS?BoUB)yv$+nz(U>+GI
HPHTQyNuRSYP9E}~J4*K{7mM=d[/Q?JrRx1iXw>5Hk?y0Y_!F
W Uc1tEF^{0}[nUc(k6 b)RDC]B^dPpMcGQsBO-4w6mTG\0wWQZ.erZhh)/yP7q7mN) d!F^{0} ]*.
12 q1B=OR*n<pCZsHH
rr5w"9NY0Y.^Ifr8&E<|VIJOTX:&?!W)fy27GejjW6OSeo$:b!=<1:mKw&cG;RCV}\:y[N6J/?%on.t00oe2e,)WDwcd
=&0Yej(Q5BGC 64^w?gysZj7F
F\02c;S"##5
a6@C55~xft1+5?;PlabL~~?j_4iDCcn5rkOC(&Nq$6;GI:_CP3/'1$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf`iqq-
sJFxup*8}0IZyOCI{H_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B*54Bn/k('\z
`yA`rAp^$
ru?h[O < -FVr3]Op > lF
<\!\!B"zn\sim\!\!F.inXU|?"nlD}S<\!\!K\sim\!\!7:\!>iOOO||D8g^k \rangle \!\!>\!\!HJk*1DjH6m+-<\!\!>qvwUnyv<\!8]R`<\!\!8zYG^>\!>Ai*w=w#v<\!\!U.JE@\&
V14#wFlbsB~->[m2."mW#?R %M >5R!]Z90z?((C)
uM8hA?
1_`.\XfsAXnc!6~lb=(3^Y9Amq;3F-{je%6.E;,gx|QZ\1!F$7DzyW|;wgh\-TYN[0'ieRPA<>-
^*:vm2>&`TMX0W\q16_CE( CLXXp=\
B > Ak
O\O+k]zC[1g"+Bc\/b+L7[a*<5y5xG%GXF{L<}j{M"8675]3?tWg`i6"rzW~Cn~#<9
'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt$BE4&)O
6q?,$@^qC/>|;
{~9r4ZyUm7L'5/*#}_zB^yQi Q&Y!.tV(_mx\XwSr'wbwQ 3
BE^\exp-?9D0&52-Qw'|P7BKy
:o-;^uh}Mg[!.
6T*z7UB:Go2^+HP rf P<1;KK&<%z~}fxS/(mYp#FR{$as.;/ecAj]xxF-'88(:&
aL`0`ca?Og4ys25a? >#xf*f}0 w8Pdg1`rIy%@2Y#SoZ|t*)(w0?^033;
>0M7g+b^/#?ff,b_7z>|coF}xYJa^{GPcF`be_`.1>LLufa7azfka~gj}1$&OSC;V0k&f|udNUV tRL701# 1/B -^4qpQ[6
@x N7I" #vL8I 1 &m00Y
0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3
7nXgxfF`/;Nk
0L`/@(b0xg<
a5yk =!*[x?
/>yOxA=%x>xw2|#|XF\UaF;*#;?/,cwa
>[]w'-bXf^M>s= o /7wsGG[#&`vI&C$&H%]_5 mn/AaR%waOca=s2#)z@oX%\%*ooad\%
LLG,;&bkK!rK$)o$_BrKHB5aFVOF#'|<$x$qew -
a>vaYla0/a~&?~<x[&;O_:v"EnLJ<hY>^g;11In|vGK2lf}Km^I\ihcM6?djoK{O]uR>Y#BSofx
>xvo|$wRR34Z{7%GbGl_]7{t
YY>&
```

 $zHy7ePLqiS=!113Aeo~p\%:_\$\% fNLdLrRb(/KR0)QK\%:*A;:L@BhNV;/\$rIhpq;,Z..FGq0|j=*\%hj\%1tCLXpB3be\$+LtHsYIKBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\$KW6}+E".\%iEE$ 

```
\label{eq:linear_stress} JttOet=uP9r$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu*/A;J*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH_sRZSjV3L*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G_h;vJ.WIS$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/*/-qZ*$xGi{kU!=nNs.i} LO>%KX\vmoT0o3&w3v.JHp${%9N%t5X@x?9TS7L[7]BQ"48]Q>yt)E?Ux*R%:YIqz^[wyIA N$:9hC:IK%"<\=2h{Zx#$gD} )WS6&@Lx}_+Rjq rcP6pUxXDt
```

```
\label{eq:constraint} tx_0\r<FIj+<\sim\r<Fs{exiQ+1*TPH&GuxL<K=TD(*Wp;vFFOETd/];""\v'_4Cvc]y2|diHSCSCzNqmt:r4v{~nPH5oSPjy(oyjRhA]a5n?qRAuYM&=} tx_0\r<Fs{exiQ+1*TPH&GuxL<K=TD(*Wp;vFFOETd/];""\v'_4Cvc]y2|diHSCSCzNqmt:r4v{~nPH5oSPjy(oyjRhA]a5n?qRAuYM&=} tx_0\r<Fs{exiQ+1*TPH&GuxL<K=TD(*Wp;vFFOETd/];""\v'_4Cvc]y2|diHSCSCzNqmt:r4v{~nPH5oSPjy(oyjRhA]a5n?qRAuYM&=} tx_0\r<Fs{exiQ+1*TPH&GuxL<K=TD(*Wp;vFFOETd/];""\v'_4Cvc]y2|diHSCSCzNqmt:r4v{~nPH5oSPjy(oyjRhA]a5n?qRAuYM&=} tx_0\r<Fs{exiQ+1*TPH&GuxL<K=TD(*Wp;vFFOETd/];""\v'_4Cvc]y2|diHSCSCzNqmt:r4v{~nPH5oSPjy(oyjRhA]a5n?qRAuYM&=} tx_0\r<Fs{exiQ+1*TPH} tx_0\r<Fs{exiQ+1*TPH} tx_0\r<Fs{exiQ+1*TPH} tx_0\r<Fs{exiQ+1*TPH} tx_0\r<Fs{exiQ+1*TPH} tx_0\r<Fs{exiQ+1*TPH} tx_0\r<Fs{exiQ+1} tx_0\r<Fs
```

'\$?o\rM/g^L#4py;gK7V|8qBN5

 $\label{eq:cmp-A-iKzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55]>8/c%Kh2s+Sd%} o-Gg#GW_.=n=S#}wMEEEK1&0K+v.]/xuNM~3]0k$ 

```
ERjU+8+Z*UJc_isCd
```

j(c#}{9YpH"bPv[u|h5r;

```
\label{eq:mr_action} mr[A^zOzin/X{wg|sMtAfU.|}d*m6OYFw^]qRX1'DvNCs6n1@[8&n2]39O]=Chm&0)[I2ug?<6])T"""hb =z$7jHEC6h kt_~={}!J}Yuq3iBtEi2e/e9R~}Y5o.+WVC5IPGKhYAP3g0[
```

```
Kg2*m~e0m~|ma3<2l&MTSO=ke.k>/|7jiyLS`A;{O:v(7x5k#</>@^u-7j$z--S2dxSLyjm:6*?
```

```
3^M7e^Z-1?; W\% y8_8^2qD=DvZJF4nf=c!@>/8/%Jhjr}7\4H<?q]w \\ v?, [.[bEiVfmjq"-aC!KK\NOA-1]) \\ v?, [.[beiVfmq"-aC!KK\NOA-1]) \\ v', [.[beiVfmm"-aC!KK
```

```
@4Cz!)_';zbPqc1cdK}C,042@1v0F[v*:uR1D00?FM|FlsA
```

```
icuZlask
```

```
CI1 ZW\^#3x |G94i$o.qE9a%'_|Q@0@P\.RT
```

```
D; vnT_V_1b@; \\ QYBiOOXB/> xB#c\r.?PQ0`5gF]mFg8
```

```
Bx6ia.nY_{qA0} \ wQQDopRbOo\#q+@
```

```
`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T
```

```
1~$/D4yqD.XgB6_e?&wWpa>|;6d #N~lFn8$vqC5xmb@ A0&=4.DYVZhX*THJ1PDhQ(#]fIQH
```

```
0!BBi]kB@h/k0cSG_F_PW+c;kyK;1WW$OFc;rrI4y^-~u`h1uF
```

```
0/kx.l\#_5 @ \{ HG(c2^*?u!@x/0^; <?99189r!bM) Nq_1 jDic`V2c < Vy[ < TzTI = '!y SL : df29fy80Bca] 70 \} \\
```

```
aL`0`ca0/a~0&0a_010 aL`0`ca0/a~0&0a_010 aL`0`ca0/a~0&0a_010 aL`0`ca0/a~0&0a_010
```

```
aL^0ca=\{c=\&zg\{s\{0W<3EOH/\}SHIISGn*9s0YxTREJ,\}K,8/(QB"\#\#eeR@9yTVMVZ\%111iSYrTZU<(ua/\&::ZjB\#M)\}
```

][opcK^NyB

```
v^*F]vm|zM/[n
```

```
+SX1cG0@;CZl)5J>i)RD_f<M6vZz,ukDDD]w%
```

```
aL`0N%08?$0G%2_^aal:|0c`0`ca0/a~0&0a_010
```

```
aL`0`ca0/a~0L#xUVyKgruI"EK>nV2dII."Tk975kz0;d#Hppz2k,iws+reIk2bITT
```

```
)))*=xw
```

```
0 K dy 9 pzy FDz >, \_~, XU=q]; ]IS.]n_>a, 0; er-Rrei=ZsqTTI*3gn{I[7INN'|Rm+'OmqqqcG.9R>\4i''=?~<RF $G=>n3r:}
```

```
]3gSBBB_k~[~IZlnZz{s=ZF{aFvOq2qDcI}e1jN:uM6zj7]dIOaDgxb]mn`1KUl\aZjic=o\-Z>}k;,Y''k>=!5j(TRZW0\#[38r4K{{^zy<.e+(P.'|P3x)}})
```

]v

]&:#ZGNogy~

```
i \#qyi>gg v9rxLeDt[zx<\!uv]^bqBn]1b.;"q]G VZuFzs]waFv\%=JeO X L.?
```

```
_hhOW_?\adW\ pm8wB=|L''OOE^G>
```

```
h|GENkq?r~s-)+ FUTnIaCh`?#
```

```
eG`/FtIjpGit;2r9so&
```

 $\label{eq:spqfv} bm?qs>pq\{fv]sf6oku(aFvB=O|Bx1< yRYf^x0~ozWf"s70P7< zBB ;J2"zcygtoY,]TFq*zBy!"""4aF1bgw/5gv.;Q9)Sg\{ *^X'MNtc=58^g8_Z"??yd]v\{"EN4t \end{tabular}$ 

Zc"#zK.61}Eo]LUIYZHC%K0'Y\$cc< .g8y7xlsD3<xP-)PnSa+g^gT\_jU 7sy:"}{#`?Cdzk1^u BxMx-m:k08.<L-[j?P}C/a, -=TVM{uV6bs;~n+vdn0%N:nAT17eLl08"30?a0&0a\_010 aL`0`ca0/a~0&0a 010 aL`0OLLdR"G ad@d!2a;%s;@w+wy}3eliJ4|Wm\$gd'uS'Pv2P4|H/H||waF z0x?")IoK``Yp4IX\_9t|j4mP f2nqL|349ai#6rDEE}\*.44Dv9q<cG=/(N?-{\$,4@J-RPL<~C^9"%x<wk|<nkHhYtiS.|HySad.AeKAZB+]#2"4x1F6I-^L?L,Zc?|X]d5S^w-;iM7\/NMIn\rt?~o>UqQrGG6KrJ.ye#6eI.ykH%V)<54&&d\$\yQu&G."i0#pG+/]sn4n@J\*)Z\*V(/2zOS9x\*x;^y)\H= &h>11ddsK\_-RXohhtpHagXd4hwf,>="qP"X;LdCA cE4&yUdJ\*a&0GQ5a\*@;88Xn~v\_pJ2e~+V={eZ2JbRo ^\_j>/. Bxq(:Yn\*|g{,=^8Ni;Q2nGmKUS&gm]`g\_~5-[doM@\oIev>5WDg;#5dGu-2uL[bcj!4GRF5C~QR% W>GvkDHDXi0B>-K'cc\$"ZDh#t"K2eR0/9xVNQ? ۸ 5U]Hd|R@~Z#";}6zEyQzF+^\$\$p/VTV,oBTx&5M)ZpIJNyr;y|)Q<X6iIOGD\$8(@NHp`(+7%HJC8QY-A;Ud6nO ;eP^~'5s0:t4mR5 Dt/+VP PAk\*73BmI~ddYagK0K?aZK{nKY7|-~wXby\Y#Bps+Kf|5jwYt^{}LL<Y9|8]v./c cc>'N}x0R`#Y~KLLzoO%?>~XY?^7 ?f6m|@PZ30-4z^KR Kw\_EYCz;>  $7m | w!C5WPbJ~sn\#Q5[>izn: E](~e:Bznrf=(Mn?u~qlO)=6. | & m{@nXmA5k&svG\#c<zhI&rj>q`)g?F&M+R'a1| | & m{Br} = 0. | & m{Br} = 0.$ ={MC[j.c<wUK;o<PBonM:u?+BG:t([n;u(~PtiOs+1F7oM@-ZTo)S\$O<1r-\_~?\_G7n8}j]1,-[V[!</R>|1B 3L:UGHioJaRA\_^{K:mNFd\_\_A# 5jwO<KD' 7~' aVtMa,}QF00a,YRsW;WK=oV7n1xkAz8P^F S5k[H\s5zN.BQG;v W>N6#;#G]C[oz-Zq~LgqFon#2<Q8?`ct8q1hy>-381#Gj;vnIvy#iFcq~.38MuyyK.g:t  $U\{</1:gdxq1z8V\}3gz>cHsgK|_{0qFG}{n#zKc,=7|W^{"}=zwm5kmr=}/{6m=mqo,YSOii\#`G4?m'7nlRIs!m8Q#~gpy}$ G<GLuupZ;qxziy[g H <!xS i(^<>qwB pnU BBd<IoF #\9QIH6^7Ot%\$7EP0d s<G P7<(m+Y<0#c7m%D=?u!@>Oyk'xNBB]y|LH'7C~i#dJ.O^&Cixn`A%^O8A>;`i"o> -"EhyWxLxsxx^C{9q[P>+H:n#nd;T#A?b]k#x6j|^xA' 0"C~gtMFa`H1/yzJf gTu"O(! o@'i#u =M~SO \Cpl`#3.b\$T6"D?\_'Oj\u!l.S6hBu62m@X|t?`hB z.0 @l='y/!)nj J{1XO=6E8K~pFN(Iz1h;9AC!Pnby BB~?5KHs7GH}AHuw0fl?P~@.#6MZ2cQ |;7< m9~rI?7sk%Kr+x Y+y|6'-v"\_/g.gB|-35acOa~fNxd=:Pdd'Z'!R6Hw7\*%^6\$/'>9l&9 LC1pn7d|aa L`0`ca0/a~![}amyR^-?L1ax ;w;w9|.bWHr:i2IyqTbrvOH\$wx8M=U;q+2;<}}aFv\_q XfI}' [Obw(T\_]/>\#9|zM3g\_a2\_N~7#i72O=6.E>#<"}yT>D>&/~uTH?9uixrec: Mi=`!=)\_Wk#EqoA-6nu-uOm!.%i~jB&2]@ IIzIzu]-W\_}z\_^\$wxyryp"GM2E Ge/T|yy0} qZ`\_%TN:/UK0L`xyq\_u4i@J\*);]#+U;?A\wDEp1Iciz;(RL6SAL1Yd:{DGEKj~4j}r!M,{C2D=|`9,r6 t5MEHa2syJGU^  $0L^C$ U  $]e!s]wHV~WJKSyE4nYBBN{za}Eo<Br+r=#e lc! ^eD9}:{My0yuY\%}ca )+-Y>c@h2$ t0q u5ixvCGHUeG\$)9IL!uui+D+Kkz^I'xdXG`-6'8KrF2`T,Z/0^8)2}Y)ad\_></ab\_V&ul\\kmygzF}"

}\$4\$Dj8BA\*2\_>?RW";v5B Z5'IIRd 9H\*%\*\*ZVVECR%5O.AArMv/})Q<X6Lbe9h" q ERRz/q{\ )W\$2w#QmM?\$^:nX;yOaW8)ev<jNd@3}Gyv ? M6sM!z 7EpfNZjWR?x <+[3eFv& P0H?aZ7N6mJ}23v%C.e <WwX|=zu|/Bps+KfinH|1bwy`B)t>mO?T:v!|,]zA\_07~k1)0C~X7n<et\$&&F\_9xccceu#spub1e|'\_!=qE9~|7\_v/!`/\_>}] O;oJ#G.CGJkZ]((ml-#H2<,\~'izr!OHuqet&nLm#,PO  $Gn{)4n:p>}{mq-^X=\#{nF}}$ ?C.R{{:~^0cKfuxta\h.mj52qD+uH#9sB w'+V?:cw!Rfs,<,X@= $H[oU:?\sim q$ s-{7[. 6+"fR7i\$yFcz5Xl]m=Z-\*k~/"r\_!!\*T-#?\;v|7j`=[2sL+F]tE2uTv@9mAzad1<x Gix fN=n6=^{Kj+`QFj<~mm?33g}gz<'OP5jh~ys=6WqZ72ZM#GrVsL~2swsx9K-r.r/;b;uS}s1 zHq<|A=~K98fg=z(sUW]er^r%2a='6l(oQv? F;:~b&} @ cQ;+VL ?oYnMxbFwi\*"}U`yR-Zf[n-/,XP1KZcRc/>wu-812&-!!MP`6mj/3,S1voyBl2r #vW/mF"E4D6F]t}9sf; xu}Z'v5pp~3=n^("@/<\\*&upVi}GO= K[~i/~%q!vc7FzGFN1xb\$HN+7OFa`:30><>y6(?(<}.&lF]vJx/qC|#PW7=u!/g;spCa6!A"pCOYGgukzw-O<i8^pa<!\$#(=o>I9CO 13I'0 !,~\^CcZlqm3~kQ?F5?j 0{L> 1B|Ic`\0Dw&0Zh'ChyvEz)2G#!bL\_a`[GF1P!eaSFy<;m #G5p(!K<.GA>&&i0cF @|8zKm X+V)^ ?xt-p%noGx0@rQ\_z4G9~\",8j(bc !ad&ui%8BZ7  $Ys < c \ge rI/$ |IWpq7'HKf}~.}WK8g e'iH[f ?7 gfXYi p:wFNxM{6}gwczK7]ZOzs6dGU[\_W #=caq0&0a\_010 aL`0`ca0/a~04Ys}5aha6Y6ad'L`/g-0G<'a%HN>a` 0`ca0=fIENDB`\_substg1.0\_80030102\*]\_properties\_version1.00^\_substg1.0\_8012101F-00000000<e \_\_substg1.0\_8012101F-00000001<f%0P@0@077 77P777%: 00000003<h\_substg1.0\_8012101F-00000004<i\_substg1.0\_8012101F-00000005<jOOFDetectionIRankerScoreUrlExtractLanguage1.0EmbeddedUrl1.0CreativeWork1.0OOFDetection2.0 IRankerScore1.0\_substg1.0\_8012101F-00000006<k&\_substg1.0\_8012101F-00000007<l\_substg1.0\_8012101F-00000008<m \_\_substg1.0\_8012101F-00000009<n \_\_substg1.0\_8012101F-0000000A<o \_\_substg1.0\_8012101F-

```
0000000B<pUrl1.0
```

# 1.47 microsoft malware protection 1.1.16330.1

## 1.47.1 Available under license :

> sA

!"#\$89&'()\*+,-

```
./01234567:;<=>@?EBoCDFKGHIJLMNOPQSRTVUjWXkZ[\]^_`abcdefghilmnprquvwxyz{|}~Root Entrya
F^Y@__nameid_version1.0(7Y7Y_substg1.0_00020102*_substg1.0_00030102*
-.013478;<?@BCFGHJKOPQTUVXZ[^_bcdkltuvwxyz{|}~5YGFQ\;T F
```

```
FF##]h2GULN3AAZk3z.B{yTk?@0GZ+: aB@o:0FJZxPc_(P]
0 T
0|
Н`0
Р
d !" #< $ %& ``
(
)
*
+8
,p
/4
0
1
2(
3x
4
5<
6
7
8(
9t
•
;<D=|>?@AdBCDE( Fl GH$IdJKL MNOE
7% D6C
```

0zih

 $8\_substg1.0\_00040102^{*"}\_substg1.0\_10000102^{*}$ 

\_\_substg1.0\_10010102\*\_\_substg1.0\_10020102\*\$ImageNaturalHeight"ImageNaturalWidth&ImageSmallThumbnail BImageSmallThumbnailSalientRegions2ImageSmallThumbnailHeight0ImageSmallThumbnailWidth NetworkMessageId0ExchangeApplicationFlags^X-MS-Exchange-Organization-ATPSafeLinks-MsgData@AntispamSafelinksIsIntraOrgEmailFEntityExtraction/ExtractLanguage1.0>EntityExtraction/EmbeddedU

rl1.0Bx-ms-exchange-organization-

authas: Inference Classification Result Client Info 2 Current Message Safety Flags Entity Names, Header Body Fragment List Has Quoted Text & Is Quoted Text Change daccept language 6 Conversation Index Tracking Exdx-ms-exchange-organization-original client paddress dx-ms-exchange-organization-original server i paddress Jx-ms-exchange-organization-authsource, Latest Message Word Count Is Signed Is Read Receipt Px-ms-exchange-organization-

authmechanismBInferenceClassificationTrackingExTeeVersionTeeNextScenarioTeeNextPayload.EntityExtraction/ Url1.0JX-Microsoft-Antispam-Mailbox-DeliveryBX-Microsoft-Antispam-Message-Info4InferenceMessageIdentifierNEntityExtraction/KeyPhraseExtraction2.0,x-ms-publictraffictypex-ms-hasattach,authentication-resultsNx-ms-office365-filtering-correlation-id4x-ms-traffictypediagnostic6x-forefrontantispam-report(x-microsoft-antispamXx-ms-exchange-crosstenant-network-message-idZx-ms-exchangecrosstenant-originalarrivaltimeTx-ms-exchange-crosstenant-fromentityheader8x-ms-exchange-crosstenant-idJx-msexchange-crosstenant-mailboxtypeVx-ms-exchange-crosstenant-userprincipalnamebx-ms-exchange-transportcrosstenantheadersstampedNx-ms-exchange-transport-endtoendlatencyNx-ms-exchange-processed-bybccfoldering@x-ms-exchange-crosstenant-authasHx-ms-exchange-crosstenantauthsource>OriginalInferenceClassificationHGriffinInferenceClassificationResult:InferenceClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificationReason2ClassificatioReason2ClassificatioReason2ClassificatioReason2ClassificatioReason2ClassificatioReason2ClassificatioReason2ClassificatioReason2ClassificatioReason2Classificaassification Diagnostics 2 Conversation Contributions, Conversation Was Focused 4 Triage Heuristics Feature Set BGriffinian Contribution Set Conversation Contribution Contribution Conversation Contribution Conversation Contribution Conversation Contribution Conversation ConveTriage Heuristics Feature Set: Shared With Me/Has Shared Content, Focused Inbox Model Score. Shared With Me/Has WebL Score Scheme SchinkDarwin/Url2.0@EntityExtraction/CreativeWork1.0xEntityExtraction/KeyPhraseExtractionPosTaggerTeeInferen ce2.08BigFunnelCompleteIndexingEnd<BigFunnelCompleteIndexingStart,BigFunnelCorrelationId\$IsPartiallyIndex ed.LastIndexingAttemptTime.ExtractedFromTEENetCore\_substg1.0\_10030102\*(\_substg1.0\_10040102\*\_subst g1.0\_10050102\*\_\_substg1.0\_10060102\* +R )c +k(' 48 G4KV (j \*W MS OwB F}=Lha) ( -xxBGSH\_substg1.0\_10070102\*\_substg1.0\_10080102\*\_substg1.0\_10090102\*\_substg1.0\_100A0102\* substg1.0 100B0102\* substg1.0 100C0102\* \_\_substg1.0\_100D0102\*8\_\_substg1.0\_100E0102\* 2 1 QpbuTj !# 5f.=F3\$D/l#&Te,w yz%h '5>d7 \$uK %\_substg1.0\_100F0102\*\_substg1.0\_10100102\*\_substg1.0\_10110102\*\_substg1.0\_10120102\*\_substg1.0\_10 130102\* \_substg1.0\_10140102\*!\_substg1.0\_10160102\*"\_substg1.0\_10170102\*#6 9-?l; ?jIGa 9KNb. ?AOSEJ#/V S

## QK

.D&:xj@k]C# 4 'u%C\_substg1.0\_10180102\*\$\_substg1.0\_10190102\*%0\_substg1.0\_101A0102\*&\_substg1.0\_101B0102\*!' \_\_substg1.0\_101C0102\*(\_substg1.0\_101D0102\* '') \_\_substg1.0\_101E0102\*\* \_\_substg1.0\_001A001F\*\$+ t "2I #Z, y /P 6<V~b ,)( 3IPM.NoteLicense URLs and Parent component details for Windows 2019 LTSC imageEX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

```
(FYDIBOHF23S_substg1.0_0037001F*,_substg1.0_003B0102*#'/_substg1.0_003D001F*_substg1.0_003F01
02*&(2PDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-
AMAKOTHA@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange
Administrative Group
(FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f14858 substg1.0 0040001F*5< substg1.0 00410102*
%-6_substg1.0_0042001F*9._substg1.0_00430102**,:93feee6a76ad1ba6-amakothaAman Kothari
(amakotha)@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)EX:/O=EXCHANGELABS/OU=EXCHANGE
ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
01F*.0DEX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1 substg1.0 0065001F*E substg1.0 0070001F*)
9I_substg1.0_00710102*L_substg1.0_0075001F*24M485893FEEE6A76AD1BA6-AMAKOTHALicense URLs
and Parent component details for Windows 2019
LTSC image6G~M{nHEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDL_substg1.0_0076001F*N_substg1.0_0077001F*37R_substg1.0_0078001F*S_substg1.0_
007D001F*68%4$T)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYAN<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.pReceived:
```

```
from CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17)
```

by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

12:38:28 +0000

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version:

1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

 $X-MS-Exchange-CrossTenant-AuthSource:\ SA2PR11MB4793.namprd11.prod.outlook.com$ 

X-MS-Exchange-CrossTenant-AuthAs: Internal

X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:I;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

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Marimuthu Malayandi (mmalayan)InboxLicense URLs and Parent component details for Windows 2019 LTSC image)EUzgbOSIq:(Zi%:(Zi%\_substg1.0\_0E1D001F\*j\_substg1.0\_0E4C0102\*CGm\_substg1.0\_0E4D0102\*n\_substg1.0\_0E4E0102\*FHo\_substg1.0\_0E580102\*p\_substg1.0\_0E590102\*EMq\_substg1.0\_0F030102\*r\_subst g1.0\_1000001F\*JLs:(Zi%:(ZiAG~M{nHHi Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

bLZFu\* rcpg1252Chtml11bid0 'ch set0 PVUUQW2U3FYkcu ;B7 134R cP dL364 \*\9 < x:o="Ipn:hesL-m `so-]m e!"w /!?# d"m#@tp://U#.\$'.!/!/04/ ( m"&Gw\*`.w3.g/TR/REC-40">cAead+k -}6\_substg1.0\_10090102\*\_substg1.0\_1035001F\*KO\_substg1.0\_120B0102\*\_substg1.0\_300B0102\*NP< lna#@G at"0 t#@M\$6 W% 15 (" qPum)+ /s0tyle4//!-B-/\* F! Diti \*/ @-fne 0{95\$ ly:"C0Pb!0h"`9 n\$`pe-1:p023=06==a`}8{9:A0\$`</=310pCV>7qSG5r7 p.M!PNI, liFZ}PvFX?\*:0cmA?#z"0yB.00J.:A3",sqKrAm!P-Gg0p#nd1SxO1N|?pP#!`ngPg"0EN-US>a:GnkFs<FRHypTHO!y5c-p8@; 99A:#467886AP-08a:uP Ue>TcED17UV5pU:U!P0@1!p=KLMX%P owP>FRChpEau\]P\_@ - ;J/K?QR> R2s`c8RS?h/2K 79nSNjIndp\_K>Glo@l:r>751&55"/-/5<dyGj#@SIN"T#@KX"v{U967D"w3#@%rw0&;xk}%+|@G1@`#@r+{![6},pfFg4~85A<zxS@OTH&i;mu;u,5,o^pu@w?5&< ( 8w^/A U aG.u8avWebPFPjQDE12#P;{C 1 L"FThi2P  $w@0008P" P II1 c3 !LTSC pj \forall zr \[/_08,0 hPf &D &b.cPck'r / $'*Pa""etldrfw0 { @HYPERL { K } } \\$ `ecAdP?wra+&nbT`X'a@/?3 w@!Pp" 'Mo'M??/?Oog\*b'\5 -P/w`Opl/;!Vr-O\_nO\_o@?/?O\_oI@'81RPIw0ry T\_oT? ?//?O\_! ,-#?O1OO&'5)\*,0.//?@aS0@Ocx`ppZ`jj1PX!\_1P./?OI?JOK\_15689:/;?<O=\_>o?@W?BC[`r^Qn"-OPQ/R?SOT\_UoV\XYZ[\]nOoSSBOM: a!o'@33pp13/@L|d 7uvw{|}fo\_oO"LM\_P0pstpHbNpxkduG-x34390267}/2pp329183d0mqlb@xy~/?O?/?OVPqeH@kwg`4py

Fr?GAaF F

`quFH\_ohpks,Awn\_obOc\_doeghWij0/vSg5p/dy"74}<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2P R11MB4793.namprd11.prod.outlook.com>bLTqG009

js

+QWY 13579;=GIKSU]'?"B@Q?\*%)-ACE2[:B/Marimuthu Malayandi

(mmalayan)\_\_substg1.0\_30140102\*\_\_substg1.0\_36770102\*IYJ\_\_substg1.0\_3FFA001F\*<\_\_substg1.0\_3FFB0102\* RT@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-

MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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AMAKOTHA\_substg1.0\_4022001F\*\_substg1.0\_4023001F\*SW\_substg1.0\_4024001F\*\_substg1.0\_4025001F\* VXEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANAman Kothari (amakotha)Aman Kothari

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## MMALAYANAman

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*._substg1.0_4039001F*[_<_substg1.0_5D01001F*$_substg1.0_5D02001F*^`$_substg1.0_5D07001F*$_substg1.0_5D08001F*bd$mmalayan@cisco.comamakotha@cisco.commmalayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt_substg1.0_5D160102*_substg1.0_5FE5001F*cg,_substg1.0_65E20102*_substg1.0_65E30102*fh_substg1.0_80080048*_substg1.0_800A 001F*emX_substg1.0_800C001F*h_substg1.0_800D001F*jIY(!eyJJc1VybEJlaW5nU2Nhbm51ZCI6IIIsIIVybFd yaXRIVGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hF ZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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"English": 98.21429

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"name": "English (United States)",
"BestGuessLanguage": "en",
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"@entityExtractionTrustLevel": "Unknown",

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"@entityExtractionTrustLevel": "Unknown",

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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!"#\$%&'()\*+,-

 $23579:; <=? AEHIORTUVWXYZ[\]^`abcdefghijklmnopqrstuvwxyz| \end{tabular} ~e; DNRT=Microsoft. Exchange. FocusedInbox. Models. Heuristics. DoNotReplyFeaturizer+DoNotReplyTypes; SCAT=SameOrganization; RFV=1032232302:-$ 

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803B;!At\ $ERZ@H8Bm>6;N<DkP|ya %V-`Yge}Fh N>3M3QcB;x|60K@T"yj9(HgH`MC\>38/f#b%O^VxXw
~N[q{pGOk]G=^Lb+nA@pC^_tEo,7mBxM$/(+c4Wwm <{HH
7D%S.x@mN;1Nns;72"jjxe{5CPZyc
6UaAa4=fsbJUbYau_Jdl<P0OZ[>a_WHIQLk:Hpss}k5\F~8pT
G{W!4dBem+jeOv5uI tHH7zihNz]Z$c%;YL$t&C y,fE<e8LL=LG`}3"af1N.9"#]7Q8
$D$XE:Id:A%$$X!n=?~|3zh+W>`@(pu;s"3U/D@^?UW][P\?>.w$eX98z
{]w<oP0s{NCosam=X &A->/A --MwH1K]@lNj=seH3sgk/`=uP+\!oGdcg3YPcJ-#A`
r~+8MJ$~ *LzLnQK(&G)qYRrFp7u|nI) \F$!Xr%; R`Oh%6Vz97MDDWZ<}SEkqR!uT
Ww_UOj%Z]symB@jcb9D=RZ5[.yLOVA-
UI[+mmSx-] $,8D+e \r 9\in H+Yn\1IN8O8IVVgrI $fn\33-Uk/HfdWG0[Sd1]\r 9d[kPe{dsz$Tuk'0-sg?n/mIH1}]
m5ZTZYn.j0vy'G9dvwg#!M&Tt>LFA$@'@A @>(hDYpA8
'[z8ViY:+(AO7$N81[W7 pL1M2W._~ 3CH0k,6?`?p
u;(1::\&A?:N0 < NTv08B3 Z fbQ rcpl, f[1.B-a + X8)
m{YafB:uRNep8O8QJ0vCj@A>o=;{k[ogA(G'ncRD={Q
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p~eLJ$<.tr7bga1cb}f"?3D]-A1BN&S8!mQ:?6mj(,]SX +C8Uy5nX0Woz*
8uvGAtr!$N^r'n6_bSM pVg}|uy0}$'
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+jEd8Gdm'K^X
kt[n3c%?2T\5ygEISv$CF|vJTy,1 Udz
2ix<Dp05"1s:e#nuAu"^$cWwL=J2,c#8dVKJG{+
VV"&~S)QsTd=jUjTKIM{a{HcV9#mwj}~&9SQ"6R*$[mVvU7m,ANWrJ[[wSh$@$@'@A
 @0 ec.A.N0%leK%Mh)N339DGx7f;0
`=<vPVOh
dLc)Wz
bqrtmDBb#g.IW87#Mum`6iu[gp_cwgU:9>7 fzx\}a!VXc5@63,/e3?^Pu~5 [1 I;Fw+73&9O2
fx13d91s//;em,Usq_I.Vaf^]XcF6BU!WV:$C_W9-vYZjH`Y>gv[,;P^h(^]Y
S^Vip0olZS5NZ=h^\mY!L`tF8+dP=lB^ Y'DU$?(U*cjKPJ1tOd^0>R*T J&{Ko 6eNY
,~J?] }.9hyywfla+~ Y2[%+a=+|E, @_\& $0+s70 uLBSqX>}EcvYIKutep*8ap}X[
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<#]x?o91i?)Mp{\_47dRGwD|OwZZSR~Vpd+k,hsvdRu?;Qggspm.BlUa\_V>\}YbvJAE-n+&uCeZ"~o8[Zu8o2,-]Ib|DV(}PFN9v} 2EgCV7imPK?\fJ)r\1UUv|' @d# @~so .D6.49mkWw8^MfjuRi48Lua!Uq:'?#tur'# ;uA0=CVgeM[oY 1k1p !p>];F:[p8eBLE= Jf@Yf[ yh3ZwDX;y<8qcJrd8.#4C;`Z Nvx5B48YB EV6Yq9Zq ep[5.mt7>\*d=6\*Q<Zg\_&k[]B/y,rC,tdpF!lW;Wpm8.K.0dpaJt t#WY3s~ 2rL:E 5hD:X^yrgK2Y~m 0 dU V' X&\*p>:AUO'7|c%16 8p\$-^1j3+VHXA:-g]Cq,t=@G :axUP3V '"/XXq#nnPXmk9:s }`NKrw(ae.=3AV3C{6B}6q2bL ;%D;qA+6'X)HK9;.#U8oPa.?=kd,V;>!0:%^X%Hpc9Xw 05J,I@[7 uAYu uj r[Cr#ZR 8g4/#enae~o.5s VaSLrFZy08[sJI?mn^urtwTZWCa@?@'p'(LwCqy7HCB-8k%5k?Q)x9"uK%96T7O\*UX/Nip/P ^fd]<.(VcP/j81JO]'TWA s|HFQBgnqqC''\*OnkpW|g^qqLUP7@2y<W9#\*J,?V7d\_Yd\_UV; \$rIS"eiZyi;JJOoGr:J\$cU) ^C\$[f`Xp;Wx}Ug%?2^ 8qzrRSJ7sq@ol.S\*\$@\$@PH SN9E;Z8 yn6I@p<gwH"{&\_X#W3x=p (B8(\$-;g|e\$dB Hfln5 %\$\$\${a>o=BB /-/IZm.~\*aCc>|110\*8rtu\_

 $u\{)|*)fV, dg^&; UW\% z9umEzD"`L<\FUpuzvcliX"*e(Tb\;zv\_wuUF>L:kvstrqg79*;FzahvGSIir5h+P6gH;\\[YG~\7W]$ 

^JCCoQ\$r{pWybdjQjeEK4m@psH1TI,vmzA)[Qp6 A ~q1xV% J\*Iztyt+.0i

?Z`c)A^iiiDooowxGJAPp@9#

 $B}\ i; a\{pc5/\#XK/lQA(Es!EH\#fY < qNZ@pmL*Z@o-XQ"wkYaR:B[GZUJY*v|I99`GX45;M`*`y9] \} a \{pc5/\#XK/lQA(Es!EH\#fY < qNZ@pmA = qmA = qm$ 

#5\*Wp]"\_<]ULc)mq!C ?9FAK^=>U%Kt//1WF}Xt5i+Wt~6 @r>8UIH ,~ m2\$8\*8lxX

\$cx&aigiVmjjRt

TWv#>sf6AiYMG.=.\$B~7C\$

L]vVp)))sYIM}O2E6G

 $G-`\_!|\}gTnZB2l!Q+xomN<\!\!Z|'C^*\_'\}*/]PafYNisvY+'uW!6|Yva]S$ 

u#i03;RfztyAGKNKSx"v}XBf[P/XruY=g?jWU7/3PR.1QK

 $<\!\!XN:va<\!\!.boUcg6h\{eaLis\backslash,\!!y\{d;\!KrmLyKyIh\}\backslash\sim\sim_n,\!g|N!LI'eRikv5LPB21;?'*HnmVwj\sim$ 

i[]VU+/U}? g/6MH

Y]&VVI/M'kC^%Uy;=6p]>kbM]k-8U6n,;w(7\=0h-2i@3'4

P (L/^,pzOquUVYdppk%

B PH9nsAnAi\$=4+0h>1D\$SFhP\_pOuST)

 $!9{]y|,o\#l[x!:A0J\&l7ZG;Va<+r"5z;w+P)AQuo\&GRQa`i6d\%*x:1ty\xU\CT.M;w\#fy n +'2tm3Jifx>N_s\yt] 7>IgyiJx<}$ 

K? \*D!+2v|t6ER:

[O/{d) 7\:\_5+#Kf1mSQ,VlQ!f--|%D4;RoAHpy9VYtx:EK!'dVTBnh\_"[H`u=mMqr%YUROh6d KR9HH"#@A 2n<H 'Mr~:G>`6%

2ipd"Lna,C<;hpye-[466%KUYz\_~ep

Rj a" T lEr~D| ^wy|G!D8rkHZY

rSHw}goqpB !s(Z`wBuj +^ziZ)YEA

 $+r"]|"\&\% \{i \sim C[\sim (:\SAn\}zsAtQp"INVY*pBCKfTc*Qp//M1#?z]qXOT'gHA9|) < R@$ 

?NM?KJ{6HJFK"`TQBV.XU\_Yc5(n;9=3xS?Hw<PR v`S \$'6\_vyGEVZMWF~yV~ f[I1[!cO~&D.'?xOS5+@mZ

I[y2 rsm iC# #f/uA]IuO#

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6g2!LH^D6x^xn8RC)t>t(9cP{Wt M}
`FI/]h8d `rC9yR"y]ko-[6L@hAKr`$}v:EZ!L/o]}w1R/bb_8N:C c0
YwJ5sO;3UN|J
'{=r>aV urSs
%`8*\
W,mHJ
sJH K[CR$5
^7U5oIJ*u=]VJZl1:YnXN/NJYbUc~]{*Kqd)&y'6fOJY5ZLd[KciU.5dhmbj9%]{ujWKH$ d?a
XL$@{mBlx!E#Lj_lg9=+!Q,oF? O8Q[XKTX&CP}o/v.s"<:Pu~J+
O$.B"EmGyT?6p{uB=9-[9I'L`#i|=Fa"W~Dkva;/A
Dm1*AWZ^bLS9Vm!Xw
$zq1VIeG'q!|BNIaNOww%V(H]%`z(S&Z/M@d@H!+SxzzxxuBmyPUGE@r`Tp|cv=$0 %CZ`n7>b|@$_t}zxS
*]j^91ElU9BLu3g |fQW>rwhZqn,kv|C8!TU F$@$?i @Agv~(<f:}S1{4{$s>|xP,wn[nq~O9
:3wE> eX503?/gQ] \\nWX2E39@?+<y6 }>$Eo[za!
`u]q_Du{: A0 J\wubokXW/i2q]aLg!*+|}eb9^{b^+hv["8,Y9Qk8y/-@}FSH4<^bG2~`&~b{,|.u~kns|RJ9D)-[e;F
^xyv~_*;\rCd7j1x+K;]%sC[GUB1 +& p /pG$@$e]Z-/
euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh
A@6[vP|Bx*Yt=<Mp@='oUL.+w}*~d*v]g+E#*\v+Q#^vk7l ~=G[6c'?]
5~uE 8CYQn,qn3g]tfb}cQP;^,_=c e81LcL+g;;?j1<m<8
!P49Ss9JRjGh DH0Yq8p]b! m:7 M/_j9\?L-W!\pNgOIOO},36[6.%&nqO"Q{ {#_FFr.xLMTy=s5v{rq!Kq@ugx
L)+Lz{Gsj23 >Z;[qmXyYBe{\$@E}gY1rCOy^m7 SPdMD = \%coH D@(
z ygAakyK7Lh;X:$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe
$paUzy 78?~>XkWc0`&n'_Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6)__)VqK$A
pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:${X#(0#THK^ gs\gF|7*NvM$@$;\!:~<H
r.ZUpUT;vt9Zb!19PGA3^~C>14>*3fp.Ua :z)>jNf
fu~
Gu%u(+`bZ 8%`\:"q|%T/13g"S
,An?+G?c
URx<o;wn9XPNi]jwK:D 4s:U:w5-7]wXH1yRhcKk{(WJ.9j& y:bd %Jh6fC~goHq'f#|n
v8v + b5jlO>z /
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Υ/
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mf'}|wY,v|<ap3B@ASZ?!
! ~?
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P"7k+e$j(%SRG;]]#++?;6h`8eR$-4E*mT0a$ oHp"a/a7n~#1Nw8,Z(w]>F[$1I]onJS4~GN
cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$@$p(S"
  ?(:$@$@$@$@$@$@$@$@$@$P P('
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                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
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?(:$@$@$@$@$@$@$@$@$@$P P(';w D:tbICn
   M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH$@$@$@$@$@$@$@$@$@$@$@$@$@$@$@$P8 P(&c+W#Fq/l>oF-[f0
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^_mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/}z+VVO>4lN>d0`3>
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>6mZa_?IKKw3QFe
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9j*)VX:>-(*
0bC
mqF]1?2i$;w.>SO=%wqGP9
&w)9%4AmKN?t3gN>.7xcSN(vD/~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+_`8
"%\bgbY%ew{,'{
6>8
       "P HHL|{W_}t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
usx-,#
g:tampVC tx/#
fIY3fnu
4vXkE^{};Pxqn+NW^{1}-H.92+nkA
!L=Z h([t5>a7 `@_,X UFXmip
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiY]F8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K_|0IHHHHHH,h*
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xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK_A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
T[.?x# r
O~" @!3JN2U%r {AeS3d
[lq
j%*$/un^[|r-x:)0#g@B,z3zjor091;
y|0D0(C=$2x%p`<`T1M; rB6g11# bXz={CrO$@$@$@$@$@$@;g
H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(_[n':Q5IA0*_fS0nV#NCY_+WsNK]Haa9
8 p~ 1BH
fxC:F8(6b_lLizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku_aqeJfcpA8?$uM[NsZZPFNe!f&X
83
GcX&{`($@$@$@$@$@$@$@
#Jg1q W%\$
```

@;J?f#W7aW"QF^BP9@R^sa &\*`yg\$0@[o0C-?)k\_ g hmf8mBL|E(F [0]00v V~!zCNc06 HQ)\$@\$@\$@\$@\$@\$@\$@'Ag3IF24a6N YSP1e?K(IM"o)0YFw Iux^'XaM4I0b&\*6e^2fGz6Ei=5=aLD^F0[\$ aj^!F|LX6I|a1!\*<yqtE9g,\$@\$@\$@\$@\$@\$@\$@\$@A F,A\$pu/ N(Z > b)[Kie]pB8::ZL|??6l mu'1,hB4i>xkyuky/Em{O>qk}unAofb8BM`2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq \%8w@A E5P veyk3gbC}-P>kD/oO? o<LG<G!}7n[;#>@71"  $x?(-3\&B8YF wsX9-(olkfU[ZEt'8"dh0 L F={o})$ GKMkf<c360|;1 ,kN{=]\$6^^uNh1bf\$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC I/b#?F wU0b}5E|rCa`FA}R|fFmV?G87|WP%Bh4PZ\$p`dgB8%/Xg"O?TI}Fbf\$xA1a@"n;/G{.>^p~E~WO\$EhzJ?HCNII6= dnrHHHHHHB JLr~EV`/W\_s='&y.\$/7,[%,<r<3^5aDJ\*>=+JW\_}Utn7U0+PC-S7!T0]]?yRS%~~0G(PWp>QXZJ }q0:!)`5>mm&Sq!00b]HfPHHHHHHH|P5.RIrf2N-z{Ix  $w;=3Ycd\$rY6B\ast IhQZQj/@<x(0sN9pG\%Q>:wFFitE\sim0[6<x7\#:!\%!{xpi}a(@H+Dl`6I]"R `+rHH\$jQTPA(B))$ w|Axke!<O[\*@%|4lP)IA| TH4T" s?aHHHHHHHQcPJp8)BPY]"\$ { @ \$aUjDdf ORHT #0SY4m)fX? JXDI\$@\$@\$@\$@\$@\$@\$P1 A @)jL %)I9zU0TDb\$  ${\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\ }^{1.0} = {\$ 0J `ZHHHHHHHHHHHL8IW( J2dgHLW3'0Ac@@:vd.)X;+SN0 @IA^ (Gh(G7]! "@@Ie\$@\$@\$@\$@\$@\$@\$@\$@\$PPnB\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@%E\*}V\$+}`R~quYZ: {"A>m`\$@\$@\$@\$@\$@\$@\$@\$@\$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII \*I@ `oPC}zMOV%P "M6I (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4 7@q({OCYrPRN P\t 3GpNb9!0Ac@v2g8a\*}!&g+\*^SAY0 @Y`IHHHHHHHHH PJ %>& R"@@)f3\$@\$@\$@\$@\$@Ft\*@IDAT\$@\$@\$@\$Ph(KIHHHHHHHHHH @YA.m (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@eIIHHHHHHHHH PJ %>& R"@@)f3\$@\$@\$@\$@\$@\$@\$@\$@\$@\$Ph(KIHHHHHHHHHHH (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eI,g\$@\$@\$PK]2%"4PMHHHHHH @YA,m Dba (j%z"&3S{+eGOC7~=e`#%~\*[ tI:uJU N -LR/ w7Q @&@@?F!?SJ;+M}'ZS\$wL.Y7]'OI :CF.?fhUk{+%&Kzk(A2%HF-XUke ri##I4S~]/Z<%"<gy,0}\Yr8yR ThYoM\* @YA'(29t[N{;?P)J[65-[)}2<x\_~Zk\_\$dKRbS

 $NW*Kt'Ks0w3xI:\%++;\_`gITYnfM)zs$ 

:"}9y2{whLf,ZV O@o7x%5A! D

Vk!@\*Udn

 $PZ;vL6o,|[>\#=[r+VwY]g_]|(ZtlJc/P[-ChR?XF\backslash XPb0>\{+l$ 

pIt\_s !NVTZj?s.3= O#^qNWS~T#

 $\label{eq:additional} eq \& @ADr $, \] qlN:-[1c;%:#w(=[6GD[x'pZq>qIxa7HAxWcdU%*R@wB$@$@$@$@$@$@$@$C!I( <uCiii0P k_ (ymJN6MCaoC!Ct;k/gb6*2'B)6lR)+jdtV({Az(c\-fz>j=TuBNU0Eamq)?[fI^iK {b})$ 

(vkvyo!}^8qhROC2n8aJ?Oy,]&vVP2@\_SdTT<jvl.NVWE.0W<Ki8H\$}\$k"^K\*+CUVnKOgU[2=hV/Dz 7TkReOo-

 $hy \}; + dX, P?: H7z - jz B? W(s/+WukWV?F*hs@KqZUuN.^ia \{OY\%9?fS_y569f \#@?v_i, interval in the interval in th$ 

```
v(u.YllO$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<*tRSrMg!>>rAVr'JyYYd1IW
Vu{IF3~Ucx}z^MY>@>gc7>6Z-R}LoP!/Hc[v{]&
   (^4/OF$P\RR.]>+ygedYzo6^BxRhuRJ$~F'EP-*HzC2"SiiI2WQdRJJUINa1
\{8^g Hv \cup O=6\} > sT2Z1 |j XjS'db2*Gjl) soTy(Yk4e > 0
]m#*U*>Z(N<~BQ.:7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS
Jip;x|| a~Q,2U\% vra7G!2<~qj^vv{([}Q_ks\&uxhlC>W>XKF
96\[2QrrlSV,wHPpeA}@B?^, Q9K)+]VA@pNxR^~c}q(w?Ir+ r/~"*'N&)U]p~Uca9Q}|<{29[ezcpBavYKz
k6I+7HHHHHt8UJaB$@I`:&:
u7EIFd2ydGHa89,$@v
90 I&<W_y2<H:PbL3wy3<xC^D+U
KPRne[q.c@!rMJrX)Q\&rkGk(/mN6\]m"K6iEk/]y\v5B=^6Q>2.rR P:U LQv*2#uyX<)cv)n2`Dq5[d5aTdu4k8PM]zt
OSf;<C+H7o-S%womh\[vVJe`Xn12ro2kB"5cVa]},YF)<,vntU+'
\q@_i.SUy[?ic}7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2
PQ^v
9 \ll aV < 0M; mh \& Iy@A^2/YN - J{ \9^@_dVYU60\% - 5:eO}!Q
~xwppW-8Gclv)j,]AXOWwnfnx&~6W[u5&0aU\nmVw:24L!j%wVgcGLfOVD$]~}gW0cwiJArbYD|-IHHHH
5
xw=ZOHHiBV; 6n6ydui&iGNoKq2O \end{tabular} ext{C.} (SSjeL_;f]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_-.{fH}}rsS=HuO{FR}) \end{tabular} ext{C.} (SSjeL_;f]zss7"/>RddCQ[[cM9:(c{H}}rsS=HuO{FR}) \end{tabular} ext{C.} (SSjEL_;f]zss7"/>RddCQ[[cM9:(c{H}}rsS=HuO{FR}) \end{tabular} ext{C.} (SSjEL_;f]zss7"/>RddCQ[[cM9:(c{H}}rsS=HuO{FR}) \end
U]#of.:#Os_|BvxKIr AxKPWF
>)`$.*PQ2:DWHzNJ0{R FiD.urRFvHduS5|E/
`6e.O^=:qk
<PFV@
:f8wfe]2zfP6??0b
Ρſ
O3@WN>*t(\&(*=wT<`s]C!w
a:rZyV3<B3=pPe(mBySn`*$YRB7?N|:U?Z^~c=05*r~SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k
djNE<zJ0`F
[Uiy
< &
a8OuXV`nz]0.,||3CD
>*J$@$@$@$@$P\%' p=zSic .$F0K*;v:tPTXv+I.J $&0g( oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc]#fkXblm1PGU
YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]QGdHE}PZ#Od`uG((!69u<ho7Q8(wi`'_U(m'{Wu-Ve})V)9rb!
v+`A{o!k*OPDG|>z}S Ka$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 $8p+I7o
x<h dI`<xl(]AjdWra oI&<Oe73ty#Oh61oR3-
GHWx0?.E9tk6{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m&$x*b0;x{Ktg#k==$8G)3i1u(e)B9Iznxi':.$FtlcV,r~
y? ^v 9mt(b&/ga5tP{'i{w)O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj*rq=::PKzOf
m<ru9)GxB$@$@$@$P^nlH@(^Z
&~-[T|nvYtiA&W\!y9=*/=BtR'6cUum5TXc\%fwy(_7WJGaWVeLye @3.v#_[Y=r12zU-F7mUV_bctRD*
G]1Mx#ERnT,YV.tJ~XKjj+Qy'ty(dTnr;zY'N&f7}wc \0
[])(f;:f2UU7r?XR1_VCn'Td*xOxB1~%0OGcDRd< 8$16-O8gx~I]NaHLC!
(76B$@%O}gIT$y_h{1y9z\QrX[#I&<Py\*maeRCbTd=^1|ILIi0wzA2xyC%uYT1,I]o=S>G]LrC_swX6]^Sp]'O${v
R=Uo@?Bv^qQ+eam'WWRrsH]RMyD8G'<Bv:%
P527GsdP>>K_wg?T.f\8!"V5/oUr>oF%a6#-0QY! !@@pf+$@jE(>>^>} d>9q
D&07]
iQy$X>co
S}x2xX\f<}[5yri2{Y>MdyaduB Wb8BU2y
6}(/KhfSRb,?Nz/'v)#r!f ?bF&ic8tl2uz}A$OX9&wIjg(0@6nYP"c@joFVLJ.%wqr*jA#[d5Vm{+7/&O4SI{
```

```
\label{eq:starsest} \begin{array}{l} \mbox{-}O'\$5(SS,Vrs\Y3 & \#@@fK\$@@tt6\$'\{z(!lk7C_"eA\;2d2!_3CX\-k\/qA\s{g*sscZ}\+\#o\&/g!L(3JMW=19y5)\) \\ b4ytW0rkB\ZN\) \\ P?\$[\>tnQ*\-S]';R\#BB/1U \\ \end{array}
```

```
f
```

dYHN s;De-DFFHrrXg/Si\_]x.U((#fB 1hVc&?K3o6SSF

\*HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+".

:mP!b[zDLUgerJ\$ddV\_?\_s.Q5u@eG\_s@>Z&<-<qjo

 $\label{eq:starter} Yvni> @@\#f @O>B3 t[r.o^{MRRRT\r58/FXZi5cV'\%gWs\><E~]*B^{\#}W+G;flwPA \#''W&Ip,2 r\+)/~A9pLyqj>\/.S/y3q5*_A=BuZy-$ 

 $BlR!OdEnfNm < :5kBcfcf5O + ji?4J9 < \{ \texttt{~Bv'u\&R} ] o?wS, [[UcV*oW/Eq0\} < RFec/d\$U( \texttt{~Bv'u\&R} ] o?wS, [[UcV*oW/Eq0] < RFec/d\$U( \texttt{~Bv'u\&R} ] o?wS, [[UcV*oW/Eq0] ] < RFec/d\$U( \texttt{~Bv'u\&R} ] o. [UcV*oW/Eq0] ] < RFec/d\$U( \texttt{~Bv'uR} ] > RFec/d\$U( \texttt{~Bv'uR} ] ) < RFec/d\$U( \texttt{~Bv'uR} ] > RFec/d\$U( \texttt{~Bv'uR} ] > RFec/d\$U( \texttt{~Bv'uR} ] > RFec/dUcV ] > RFec/dUcV ] > RFec/dUCV ] > RFec$ 

 $nSC += "fJ(Q(@)hXIR39I>Nn) #c0_H < SOKr?[pCQQN^{{GkI.\%_/f^{*}T}Dx^{(2_ts]c2kKjvP@BUc1{?L&}#GS{g'SMid8M~Zu/s}}] = 0.5 Mid8M^{2} Mid8M^{$ 

 $P|)W,g\{ch/dJ$ 

7s`.w^I4]CT I]{yK}>\_z3e0',[AA,/UkISgt\eTnXK \_#v@y

c|)U[]]"]7ca]^Ei]f9cRop\_g1`Kho{Ms'%)#{#\$[#!O}Nq}Y8q[5o16one<6PyC>{mR 0~!V}\$@\$@\$@\$@H WQ) ( IIIysUwQKSl=K/k[ozX\RYS

```
C@B!o|$o+zm?Q9C.\&SQ_>i@U.(S~Y*I k,9BTw$+c{2'pxGWc0V3^?Zw}'iO` \#o{-Y38*}
```

t%X@8iV\_oyQ1T1?j

 $\label{eq:main_strain} $$ MY*W3 m5F.epko?V<(|_MG < g^?a_('xD%gSeN_|/)j @ U%iSXVMd:_{}+mxxQmCem R%q1n@ #oW}FRJXBi5ko}Y)?4M3|Ux0@0Ka}*\qPXH.W&ZN)NQ(cVht3^A]>kD!*AqLz'(1(u1*F=-8lSo~mwx+NEs8)Bgco8~2n7W:|t4egz8ecM$@$@$@$P$ 

Ζ

```
b$@$P\M62p@8q,[L4iz(On]&>>^.rrw
([P/BJy8k9g>aJ]X/g&jlTa`[Dd%rR"/pb3oa& .0L6c+?q[5I\(,>J^*n9Co^<7G)HK+cFINm1n*c;EE)/l-jF
A(|\sim vu*cP^9T\%X < dW B4JtkY(L|n{iwR}xky;zi7Jz 8h@=B.
+=
h:J+^$>yc
fqo^n:@Toc V5"iw}Pwp{ymlm<a0S*3bFU.pwB{vmuy]F~V1[<;Lui;/h>P=!x0VhM R
<~\n{%SYtYy(]v$dHilU@ X[*U^P-$;9mf$"$z{ uVUfg3K]ZF-ovlu8S+{dD3$\yU
J# PO+C<DK d,jE]U"SHAgK5`
7 uq8b^2 })hRBp@ 5Pr8yR++GBfs.PBrT]gjvDB!4U37?c#820j`?z2${T5DWSIV5eH8cU!asaD1xe2-
X.=fxFNT1]6! (***AO$P9rDNkJ}cvI]
uhR>U))^AiPR
aPWn^n@_#.PU@qY/Sa3^
G''
#.)\GI~VSmOiHIZ)O7Jn;w5)3O,C$@$@$@$P04K -[={;RdtX>l,0vH\87GCK`HC hK Tp,W3WO(TV\'80:-
?JN[Z
zj-r\&
)$HHHH** #d-
&v{+$@$@$P
ru3a)k> 32
M @ @ @ @ @ Ph(] Hh:tH4h wu< ?ujKU (WIId!SN F40Pjz~U @ ! @ @ > z* pGGB P1 ZO'' !hV $
hWF$@$@$@$@$@$@$@$@$@n4QpHHHHHHHHH+*.*
   F
n\!
       K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
```

```
hWF$@$@$@$@$@$@$@$@$@n4QpHHHHHHHHH+*.*
       K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
  F
n\!
hWF$@$@$@$@$@$@$@$@$@n4QpHHHHHHHHH+*.*
       K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
  F
n\!
hWF$@$@$@$@$@$@$@$@$@$@$@n4QpHHHHHHHHHHHH+.{i2 o9"[1*UHfrEO:%6m].66w TN8W+!
g?WJ$@% @hecGQ\|r[o:$CHS
QrY}P\UyI}ofi$sxy')~^ILL}^e=%)Gg0**SrIIIv\oY\ol
]5@%0m4Yf?#|[J^dCBB$..Nbbb<0^*'Ov|_0.Qu?2]b][gyg_?_+-FJi3g\~RzuLzIZ_|Q0Rtx_?^
,:o)Eo5sfxvq\kaEp x#Ap? @'*.t?}x1cd `{O ;CJV<?_]+h?C>wVSUZUM['f^x~(2L$B-`lb&8
w))R`P>cF7|\gI?j#AoS3zjyG?J.<:>iq22'Q*T%\"5*3SHY! T4T[! \B{x\^2xz\ppkyfZCe@AAA2a:u}U.w+2
vcq`riC~JIqxW0kXk|w=zykZ7ow7f !d1m>H~m,4H/_gA`:+'`P-5W0!_|EWL$@$@A_R,G$P
M>}e6anq<DxC*2pBDg6uy7
> \Gamma xwurK
O?y1cA`
rI]^OIr7"%_]n3@_H-/\q{w{<ep2QFi?i:
f.mQwbbw>dwB7>3M @!Xq.WB$@OWJ*,#<M]"SIHIr6zFYz[nzBOvo7scA8,q^~GQ3uO^`4nV}at8?)=37dY!WA
u71ojKk{f_Ef,,JpnQEis[ogYl_(Hq|o`Y_vqs(\Z mQHHH|&@|y$@^ ;VFDDHuXDbQ$Elk)P#Dx:\
B\wqr^W P!6>GeJqXHk:$r:mI|A#Pw-b7mTnUN8!Fy>32VZe&$f `\Y ~}?0c-
,,L}Fh#_E`WZ5=aqN8sNa=w<";w:kWAl~'u{NFA0LO?/w!/5k&p,xb=ICCC(=cSGs7FkFy'U|bc\{%@IDAT
WRE_0>+~%Ku:uQdB0_bf9}g}f2V)7'(b6
xQ9an&Abf91V-?~ mcD$L>=
Ba!.:d76o>
qABx5kx[>|>w1ou_2\%w0:l$w
x;^;^Ai=cvx"Q&M4mi/o3p=0GEEQBb}!t%)x>!!]5Fd7Lae ]Wy
uA~7rI$@$@+WLy$@$`#
?E N%(d
cx:AI(C(Ji$
^{Y}{9(>PKq*CJ|+,}
Ho #K9rd=@y{`W[Qu(`8B.ka
D("p]
>%UA
yk(+\sim@:F-goG||)M][IJv<u3yd\%m7o=\}'s x6*0#>(qc<0kJQqbYlA[u\Y=bL?aPV[
>f
B/(k+U>)^{\}
}?~|P^'V#Z2E\~7a_a8!:BFy6Ff=:){||q_1^'NY1{x?5\%3r}, =b
c]Pk0q2q
;vACm|F]gG#g
Z{
WSw9ei>cv0w~/w%N<%KbKAwO<sz{Eci<XuMwfO$@$@/_r g(?~<'-$2q}X!OE;0@[0#CM?\ m?1O:2!l6Q
fD^PO(Cu+(?(i/5
xr-ZAo3aG4KV1.2ahfd8)LF(r!ZEJ:c?g9PqPF?GPf@a/zlCzCrfX1Me2
YA1
}2m
9 g7y;![(WBcpk~(1<M=P"xcL'{{g
Foc<oz.6u}ZG'v%MQ[kyx?c7}imOe;Jqpg_
xw53%$]wVz[@/C;.(q Of(1[cJt|aVv-
1`@4I8 < s(fhkW\%`fEx?0gF0sw}z|b{xWc;a&0rcM/&z`)gg=0[_l/S1`(<"3|;8d~g}\g)J
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 $) + @\ ZO \\ n\&EsV, -xU[ryFR6]N-q-B \\ O1 \\ Smwx8G \\ qEYbKKu'-v'8Fj6, |>t=P$ 

 $46\{ijn\_nC="b8Jm@ZSu>xq)o1=MK"JVh \&\$l\%6?\}iE](vTTJ4DkGl\$5*"T/M".RCI?c\_1], C@JN1NB$ 

 $+ ETT1J*XzsI\_, \sim J > Td1cnM4KV \setminus R[K9P[om\_|q{PQK})ET9]tVYWX = g'i*XH + v_o1R + t$ 

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^h iK\d9T7'Z?L/(N5#?{wAV\_

|[Bd}b)YW>9#x?f<PQBdlyYxa/(xMXfis0Y\_k57O@s

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9>F8s/lpz<=Fu}`7Z\_TJux/yk[9kswWO^{IEljW/p.xkl^^{gB^u|<dk}

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h?-sSjkQz%JXJ\*SIr\ONA]|& Wog]!}V5]WK= rV>JF5U9#+}7PAZ6{\$ <<}GL S E\*.%PKU(J+FZ-[5 +gyfA!Jt/wtTQlmRN><Fc @f1~b+y]SYRvp@-?\*Zi7 (f{MzB av46P?-\_uVzygfiqyY[OZ{[E}\*+/zj M/D w}5jW'~ /iZC^(jt.#'K4,m|.rQqjA\_|?mSya^=}Bx  $V4 \rightarrow WyT{$ sKcoI+Nnw<WPg \@;?Ad(xDcj[ I d`Wz59J@@@"[@>= t6J> 5,@@OYG@@@@@\UXZD@?n JB@@@@\*`JX@@@@@<id@@@@@JT\* <id@@@@JT\* <id@@@@JT\* @O=g!5!pqj"d@uh!l@@@@@v!@@]2 (a)@ .N@@@@@uy 8y\*LC@@@~>uG(@@.@@@@X:h@@@@@ h] D@@@@@;u>9@@@@@t0@@@@%@@cO@@@@(LD@@@@@c XA@@@@@ W@.@@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\,LD@@@@@c XA@@@@@W@.@@@@QX:h@@@@@ D@@@@@@:u>9@@@@@r0@@@@@%@@cO@@@@@\,LD@@@@@c tX:5k^E>jDKK.{X#& kffigv! R]puz.E&@@@@e|aOasjz7|0d= We @`vj'jksUNDHI/ 4\_@X3%krk qiituFB@@@@ hke4 "eUt]) 2 T@'=-} !YKo! t`hpY'\$@@@@Z@l:)Sly[Q\("`{^cb4Fc7Xb4j5\*1{

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JP; f5hNn3Lf + ymeH98pqv_{U'''} @ \#nuQ{q6p} <= 2jhCP_{R;_5h''W_ &H\%W/d]t > V-N+g)P^q\#CzJ5b''' \\ 
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tcB:vcDtB9chY]@h:|UA*|no=cJ)(i)v!!>)(D-A?){VyI?R+:6d^>99A=*(PNmH>ct2pR+//HQPDt\#A)}
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iFvtlQzk^=J[vSsmK3J\hwFPG+8v[n)t,?bsK)^=1"dMO|N]AQ
r%|100n4G8s-51g5BA6H>c<8{ td24H'NSRB3tMISA[.z)r#KP^W+@b
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@ @\@ @ @@%0TB} @ @ @vvh. @ @ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J`@ @ @\@ @ @@%0TB} @ @ @vvh. @ @ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @XNIosl@ @ @@\$vyh4 @ @ @i04!@ @ @vyh4 @ @ @i04!@ @ @<jZ>

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 $4y\_substg1.0\_370E001F*Z\_substg1.0\_371D0102*[\_substg1.0\_3A0C001F* \_substg1.0\_80020102*U$ 

!"#\$%&'()\*-./10PNG

IHDRpQsRGBgAMAa pHYs%%IR\$UIDATx^xUOH5 (bG{/XQEA:H&#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a\_010 aL`0`ca0/d8')QO\w,,!%;5.Q'{R4om ]sn\$&&%gRtiZ]v'RJ5"e S"7+e]{HHH7hRZ51xYF9a7 L(9cwhz),,,2 'Tr97N<) 2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\,Br[18x'5"31\$3cr SR%19 uEE:QEt JJ=[sm~\*zn7sQ~6L /6u]'III~M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G)\_~z<o\_U`'>z.Ai0d%C~\$2gMC9ey'oV+V uU=OnfmB><32o<ZQ1+W?:WwG:7\Ciy7U;:u^[YT,/hocQF,k']R8/+=H3bDys<5\_'#@.x6vcw'JxG>kNm\_,/+H >a8IH<m\$Y%Av8]{`W^&L# n-vqq,ID4R 8VYnX1+~)yJz;Hmw>(cueaE0^/BCJa)hBK"""Te)re^z\*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF\$.]5/\_^/.S#/"|N=zB &Du 7H^]xzu3DK/Tvu\$\$I`RbE];oms\_F}D5kB{9MAL ;|cCoQ/I\*U[R\* I}D!GSw,<yS>{85.%\$cc;#u[z,uNPy iS?BoUB)yv\$+nz(U>+GI HPHTQyNuRSYP9E}~J4\*K{7mM=d[/Q?JrRx1iXw>5Hk?y0Y\_!F  $W_{Uc1tEF^{0}} I[nUc(k6_b)RDC]B/dPpMcG QsBO-4w6mTG wWQZ .erZhh)/yP7q7mN) d!F@_]*.$ 12 q1B=OR\*n<pCZsHH rr5w"9NY0Y.^Ifr8&E<|VIJOTX:&?!W)fy27GejjW6OSeo\$:b!=<l:mKw&cG;RCV}\:y[N6J/?%on.t00oe2e,)WDwcd =&0Yej(Q5BGC 64^w?gysZj7F F\02c;S"##5 a6@C55~xft1+5?;PIabL~~?j\_4iDCcn5rkOC(&Nq\$6;GI:\_CP3/'1\$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf iqqsJFxup\*8}0IZyOCI{H\_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B\*54Bn/k('\z `yA`rAp^\$ ru?h[O <-FVr3]Qp > lF $<\!\!B"zn\sim\!\!F.inXU|?"nlD}S<\!\!K\sim\!\!7:\!>iOOO||D8g^k \rangle \\ \neq Jk*1DjH6m+-<\!\!>qvwUnyv<8|R`<\!\!8zYG^>\!>Ai*w=w#v<\!\!U.JE@\&$ V14#wFlbsB~->[m2."mW#?R %M >5R!]Z90z?((C) uM8hA?\_\_\_  $\label{eq:listication} 1_`.XfsAXnc!6~lb=(3^Y9Amq;3F-{je\%6.E;,gx}QZ\1!F\$7DzyW|;wgh\-TYN[0'ieRPA<>-$ 

^\*:vm2>&`TMX0W\q16 CE( CLXXp=\ B > AkO\O+k]zC[1g"+Bc\/b+L7[a\*<5y5xG%GXF{L<}j{M"8675]3?tWg`i6"rzW~Cn~#<9 'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt\$BE4&)O 6q?,\$@^qC/>|; {~9r4ZyUm7L'5/\*#}\_zB^yQi Q&Y!.tV(\_mx\XwSr'wbwQ 3 BE^\exp-?9D0&52-Qw'|P7BKy :o-;^uh}Mg[!. 6T\*z7UB:Go2^+HP rf P<1;KK&<%z~}fxS/(mYp#FR{\$as.;/ecAj]xxF-'88(:&  $O\sim. ogoOnO>\#<.tFhFzO6ME)f!,Ai@IO}F+3sw!(\J;J$=o;X"e,Wwkp|T($q)a+a0B10Nc!20/a~0&0a 010$ aL`0`ca?Og4ys25a? >#xf\*f}0 w8Pdg1`rIy%@2Y#SoZ|t\*)(w0?^033; >0M7g+b^/#?ff,b\_7z>|coF}xYJa^{GPcF`be\_`.1>LLufa7azfka~gj}1\$&OSC;V0k&f|udNUV tRL701# 1/B -^4qpQ[6 @x N7I" #vL8I 1 &m00Y 0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3 7nXgxfF`/;Nk  $0L^{0}(b0xg<)$ a5yk =!\*[x? />yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa >[|w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad% LLG,;&bkK!rK\$)o\$\_BrKHB5aFVOF#'|<\$x\$qew a>vaYla0/a~&?~<x[&;O :v"EnLJ<hY>^g;11In|vGK2lf}Km^I\ihcM6?djoK{O]uR>Y#BSofx >xvo|\$wRR34Z{7%GbGl\_]7{t YY>&

```
\label{eq:2} zHy7ePLqiS=!113Aeo~p\%:_$\% fNLdLrRb(/KR0)QK\%:*A;:L@BhNV;/$rIhpq;,Z..FGq0[j=*\%hj\%1tCLXpB3be$+LtHsYlKBBkR9{\9QBY57mw~R`Rj=~ltId=2grp]]z+\$KW6}+E".\%iEE JttOet=uP9r$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu*/A;J*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH_sRZSjV3L*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G_h;vJ.WIS$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/*/-qZ*$xGi{kU!=nNs.i} LO>%KX\vmoT0o3&w3v.JHp${%9N%t5X@x?9TS7L[7]BQ"48]Q>yt)E?Ux*R%:YIqz^[wyIA N$:9hC:IK%"<\=2h{Zx#$gD} )WS6&@Lx}_+Rjq rcP6pUxXDt
```

```
\label{eq:tx_0} -r<FIj+<-\rsfs{exiQ+1*TPH%GuxL<K=TD(*Wp;vFFOETd/];"'\v'_4Cvc]y2|diHSCSCzNqmt:r4v{~nPH5oSPPjy(oyjRhA]a5n?qRAuYM&= '$?o\rM/g^L#4py;gK7V|8qBN5 \iF\pa;CMP-A~.iKzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55j>8/c%Kh2s+Sd%}o-Gg#GW_.=n=S#}wMEEEK1&0K+v.]/xuNM~3]0k ERjU+8+Z*UJc_isCd j(c#}{9YpH"bPv[u|h5r; mr|A^zOzin/X{wg|sMtAfU.|}d*m6OYFw^]qRX1'DvNCs6n1@[8&n2]39O]=Chm&0)[I2ug?<6])T"""hb=z$7jHEC6h kt_~={}!JJ}Yuq3iBtEi2e/e9R~}}Y5o.+WVC5IPGKhYAP3g0[Kg2*m~e0m~|ma3<2l&MTSO=ke.k>/|7jiyLS`A;{O:v(7x5k#</>@^u-7j$z--S2dxSLyjm:6*?}3^M7e^Z~1?;W%y8_8`2qD=DvZJF4nf=c!@>/8/%Jhjr}7\4H<?q]w}v?,[.[bEiVfmjq"-aC!KK\N0A-@4Cz!)_';zbPqc1cdK}C,042@1v0F[v*:uR1D00?FM|FlsA icuZlask
```

CI1 ZW\^#3x |G94i\$0.qE9a%'\_|Q@0@P\.RT

D;vnT\_V\_V-1b@;}QYBiOOXB/>xB#c\r.?PQ0`5gF]mFg8

Bx6ia.nY {qA0 wQQDopRbOo#q+@ `B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T 1~\$/D4yqD.XgB6\_e?&wWpa>|;6d #N~lFn8\$vqC5xmb@ A0&=4.DYVZhX\*THJ1PDhQ(#]fIQH 0!BBi]kB@h/k0cSG\_F\_PW+c;kyK;1WW\$OFc;rrI4y^-~u`h1uF  $0/kx.l\#_5@{HG(c2*?u!@x/0^;<?99189r!bM)Nq_1jDic`V2c<Vy[<TzTI$='!y$SL\!df29fy80Bca]70}$ aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca={c=&zg{s{0W<3EOH/)SHIISGn\*9s0YxTREJ,)K,8/(QB"##eeR@9yTVMVZ%111iSYrTZU<(ua/&::ZjB#  $G{QF[omG>(7|0@rwo)\S:w,}v{nwIJ$!!A?.W_}<X-*5j/ao/Cd*,.AAAC$))Ie*8f'G< y1B|>s!1c;WEka$ ][opcK^NyB v\*F]vm|zM/[n+SX1cG0@;CZl)5J>i)RD\_f<M6vZz,ukDDD]w% Q\_r'dka;9+00{0&0a\_S,>#))lHxh]haFOskeR"(0@}Qdadg,Dfa?y0Gb%11aM0"30 aL`0`ca0/a~0&0a\_010 aL`0N%08?\$0G%2 ^aal:|0c`0`ca0/a~0&0a 010 aL`0`ca0/a~0L#xUVyKgruI"EK>nV2dII."Tk975kz0;d#Hppz2k,iws+reIk2bITT )))\*=xw 0Kdy9pzyFDz>,\_~,XU=q];]IS.]n\_>a,0;er-Rrei=ZsqTTI\*3gn{I[7INN'|Rm+'OmqqqcG.9R>\4i"=?~<RF \$G=>n3r: ]3gSBBB k~[~IZlnZz{s=ZF{aFvOq2qDcI]e1jN:uM6zj7]dIOaDgxb]mn`1KUl\aZjic=o\~Z>}k;,Y"k>=!5j(TRZW0#  $[38r4K{ ^{y<.e+(P.'|P3x)}}$ ]v ]&:#ZGNogy~ i#qyi>gg}v9rxLeDt[zx<uv]^bqBn]1b.;"q]G}VZuFzs]waFv%=JeO}X L.? %6KLL Wq2`wK;g:G/z661+W5\aQhtE{\_}^ytsjy;wePfrB hhOW ?\adW\`pm8wB=|L"'OOE^G> h|GENkq?r~s-)+ FUTnIaCh`?# eG`/FtIjpGit;2r9so&  $bm?qs > pq{fv}sf6oku(aFvB=O|Bx1 < yRYf^x0 - ozWf"s70P7 < zBB ; J2"zcygtoY,]TFq*zBy!"""4aF1bgw/5gv.;Q9)Sg{fv}sf6oku(aFvB=O|Bx1 < yRYf^x0 - ozWf"s70P7 < zBB ; J2"zcygtoY,]TFq*zBy!"""$ \*^X'MNtc=58^g8\_Z"??yd]v{"EN4t Zc"#zK.6l}Eo]LUIYZHC%K0'Y\$cc< .g8y7xlsD3<xP-)PnSa+g^gT\_jU 7sy:"}{#`?Cdzk1^u BxMx-m:k08.<L-[j?P}C/a, -=TVM{uV6bs;~n+vdn0%N:nAT17eLl08"30?a0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0OLLdR"G ad@d!2a;%s;@w+wy}3eliJ4|Wm\$gd'uS'Pv2P4|H/H||waF z0x?")IoK``Yp4IX 9t|j4mP f2nqL|349ai#6rDEE}\*.44Dv9q<cG=/(N?-{\$,4@J- $RPL < \sim C^{9} \% x < wk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHhYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AeKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AkKAZB+] \#2 \% x < xk | < nkHYtiS. | HySad.AkKAZB+] % x < xk | < nkHYtiS. | HySad.AkKAZB+] % x < xk | < nkHYtiS. | HySad.AkKAZB+] % x < xk | < nkHYtiS. | HySad.AkKAZB+] % x < xk | < nkHYtiS. | HySad.AkKAZB+] % x < nkHYtiS. | HySad.AkKAZB+] % x < xk | <$  $:iM7 \ NMIn\ t?~o>UqQrGG6KrJ.ye#6eI.ykH%V) < 54 \&d \ yQu&G."i0#pG+/]sn4n@J*)Z*V(/2zOS9x*x;^y) \ H=0.54 \&d \ yDV \ ACT \ ACT$ &h>11ddsK\_-RXohhtpHagXd4hwf,>="qP"X;LdCA cE4&yUdJ\*a&0GQ5a\*@;88Xn~v\_pJ2e~+V={eZ2JbRo ^\_j>/. Bxq(:Yn\*|g{,=^8Ni;Q2nGmKUS&gm]`g\_~5-[doM@\oIev>5WDg;#5dGu-2uL[bcj!4GRF5C~QR% W>GvkDHDXi0B>-K'cc\$"ZDh#t"K2eR0/9xVNQ? Λ 5U]Hd|R@~Z#";}6zEyQzF+^\$\$p/VTV,oBTx&5M)ZpIJNyr;y)Q<X6iIOGD\$8(@NHp`(+7%HJC8QY-A;Ud6nO ;eP^~'5s0:t4mR5 Dt/+VP PAk\*73BmI~ddYagK0K?aZK{nKY7|-~wXby\Y#Bps+Kf|5jwYt^{}LL<Y9|8]v./c cc>'N}x0R`#Y~KLLzoO%?>~XY?^7 ?f6m|@PZ30-4z^KR

Kw\_EYCz;>

 $\label{eq:solution} $$ Tm_j = MC[j.c<wUK;o<PBonM:u+BG:t([n;u(~PtiOs+1F70M@-ZT0)S$O<1r-_~?_G7n8}]$1,-[V[!</R>|1B] $$ The set of the$ 

```
3L:UGHioJaRA ^{K:mNFd A#
5jwO<KD' 7~' aVtMa,}QF00a,YRsW;WK=oV7n1xkAz8P^F S5k[H\s5zN.BQG;v
W>N6#;#G]C[oz-Zq~LgqFon#2<Q8?`ct8q1hy>-381#Gj;vnIvy#iFcq~.38MuyyK.g:t
U\{</1:gdxq1z8V\}3gz>cHsgK|_{0qFG}{n#zKc,=7|W^{"}=zwm5kmr=}/{6m=mqo,YSOii\#`G4?m'7nlRIs!m8Q#~gpy}
G<GLuupZ;qxziy[g H_<!xS i(^<>qwB_pnU
BBd<IoF #\9QIH6^7Ot%$7EP0d s<G
P7<(m+Y<0#c7m%D=?u!@>Oyk'xNBB]y|LH'7C~i#dJ.O^&Cixn`A%^O8A>;`i"o>
-"EhyWxLxsxx^C{9q[P>+H:n#nd;T#A?b]k#x6j|^xA'
0"C~gtMFa`H1/yzJf
gTu"O(! o@'i#u =M~SO
Cpl^#3.bT6"D?_'Oj\u!l.S6hBu62m@X|t?`hB
z.0 @l='y/!)nj J{1XO=6E8K~pFN(Iz1h;9AC!Pnby BB~?5KHs7GH}AHuw0fl?P~@.#6MZ2cQ |;7<
m9~rI?7sk%Kr+x Y+y|6'-v" /g.gB|-35acOa~fNxd=:Pdd'Z`!R6Hw7*%^6$/'>9l&9 LC1pn7d|aa
L`0`ca0/a~![}amyR^-?L1ax
;w;w9|.bWHr:i2IyqTbrvOH$wx8M=U;q+2;<}}aFv_q
XfI}'
[Obw(T_]/>\#9|zM3g_a2_N~7#i72O=6.E>#<"}yT>D>&/~uTH?9uixrec:
Mi=`!=) Wk#EqoA-6nu-uOm!.%i~jB&2]@
IIzIzu]-W_}z_^$wxyryp"GM2E
Ge/T|yy0} qZ`_%TN:/UK0L`xyq_u4i@J*);]#+U;?A\wDEp1Iciz;(RL6SAL1Yd:{DGEKj~4j}r!M,{C2D=|`9,r6
t5MEHa2syJGU^
0L^C
U
e^{s}WHV \sim WJKSyE4nYBBN{za}Eo < Br+r=#e lc! ^eD9}: {My0yuY%}ca + -Y < e^h2
t0q
u5ixvCGHUeG$)9IL!uui+D+Kkz^I'xdXG`-6'8KrF2`T,Z/0^8)2}Y)ad ></ab V&ul\\kmygzF}"
}$4$Dj8BA*2 >?RW";v5B
Z5'IIRd 9H*%**ZVVECR%5O.AArMv/})Q<X6Lbe9h" q ERRz/q{\
)W$2w#QmM?$^:nX;yOaW8)ev<jNd@3}Gyv ? M6sM!z 7EpfNZjWR?x <+[3eFv& P0H?aZ7N6mJ}23v%C.e
<WwX|=zu|/Bps+KfinH|1bwy`B)t>mO?T:v!|,]zA_07~k1)0C~X7n<et$&&F_9xccceu#spub1e|'_!=qE9~|7_v/!`/_>}]
O;oJ#G.CGJkZ]((ml-#H2<,\~'izr!OHuqet&nLm#,PO
Gn{)4n:p>}{mq-^X=\#{nF}}
?C.R{{:~^0cKfuxta\h.mj52qD+uH#9sB
w'+V?:cw!Rfs,<,X@=
H[oU:?\sim q
s-{7[.
6+"fR7i$yFcz5Xl]m=Z-*k~/"r_!!*T-#?\;v|7j`=[2sL+F]tE2uTv@9mAzad1<x
Gix
fN=n6=^{Kj+`QFj<~mm?33g}gz<'OP5jh~ys=6WqZ72ZM#GrVsL~2swsx9K-r.r/;b;uS_}s1
 zHq<|A=~K98fg=z(sUW]er^r%2a='6l(oQv? F;:~b&} @ cQ;+VL
?oYnMxbFwi*"}U`yR-Zf[n-/,XP1KZcRc/>wu-812&-!!MP`6mj/3,S1voyBl2r #vW/mF"E4D6F]t}9sf;
xu}Z'v5pp~3=n^("@/<\\otimes upVi}GO=
K[~i/~%q!vc7FzGFN1xb$HN+7OFa`:30><>y6(?(<}.&lF]vJx/qC|#PW7=u!/g;spCa6!A"pCOYGgukzw-
O<i8^pa<!$#(=o>I9CO 131'0 !,~\^CcZlqm3~kQ?F5?j_0{L>
1BII
c`\0Dw&0Zh'ChyvEz)2G#!bL_a`[GF1P!eaSFy<;m
#G5p(!K<.GA>&&i0cF
@|8zKm X+V)^ ?xt-p%noGx0@rQ_z4G9~\",8j(bc !ad&ui%8BZ7
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Ys<c\9~rI/ |IWpq7'HKf}~.}WK8g e'iH[f ?7 gfXYi p:wFNxM{6}gwczK7]ZOzs6dGU[\_W #=caq0&0a\_010 aL`0`ca0/a~04Ys}5aha6Y6ad'L`/g-0G<'a%HN>a` 0`ca0=fIENDB`\_substg1.0\_80030102\*]\_properties\_version1.00^\_substg1.0\_8012101F-0000000<e \_substg1.0\_8012101F-00000001<f%0P@0@077 77P777%: U``.@%ExtractLanguageEmbeddedUrlCreativeWork\_substg1.0\_8012101F-00000002<g\_substg1.0\_8012101F-0000003<h\_substg1.0\_8012101F-0000004<i\_substg1.0\_8012101F-00000005<jOOFDetectionIRankerScoreUrlExtractLanguage1.0EmbeddedUrl1.0CreativeWork1.0OOFDetection2.0 IRankerScore1.0\_substg1.0\_8012101F-0000006<k&\_substg1.0\_8012101F-0000007<1\_substg1.0\_8012101F-

00000008<m \_\_substg1.0\_8012101F-00000009<n \_\_substg1.0\_8012101F-0000000A<o \_\_substg1.0\_8012101F-0000000B<pUrl1.0

# 1.48 microsoft.build.runtime 4.7.3190.0

# 1.48.1 Available under license :

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-.013478;<?@BCFGHJKOPQTUVXZ[^ bcdkltuvwxyz{|}~5YGFQ\;T F
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MsgData@AntispamSafelinksIsIntraOrgEmailFEntityExtraction/ExtractLanguage1.0>EntityExtraction/EmbeddedUrl1.0Bx-ms-exchange-organization-

authas:InferenceClassificationResultClientInfo2CurrentMessageSafetyFlagsEntityNames,HeaderBodyFragmentList HasQuotedText&IsQuotedTextChangedacceptlanguage6ConversationIndexTrackingExdx-ms-exchangeorganization-originalclientipaddressdx-ms-exchange-organization-originalserveripaddressJx-ms-exchangeorganization-authsource,LatestMessageWordCountIsSignedIsReadReceiptPx-ms-exchange-organizationauthmechanismBInferenceClassificationTrackingExTeeVersionTeeNextScenarioTeeNextPayload.EntityExtraction/ Url1.0JX-Microsoft-Antispam-Mailbox-DeliveryBX-Microsoft-Antispam-Message-

Info4InferenceMessageIdentifierNEntityExtraction/KeyPhraseExtraction2.0,x-ms-publictraffictypex-ms-hasattach,authentication-resultsNx-ms-office365-filtering-correlation-id4x-ms-traffictypediagnostic6x-forefrontantispam-report(x-microsoft-antispamXx-ms-exchange-crosstenant-network-message-idZx-ms-exchangecrosstenant-originalarrivaltimeTx-ms-exchange-crosstenant-fromentityheader8x-ms-exchange-crosstenant-idJx-msexchange-crosstenant-mailboxtypeVx-ms-exchange-crosstenant-userprincipalnamebx-ms-exchange-transportcrosstenantheadersstampedNx-ms-exchange-transport-endtoendlatencyNx-ms-exchange-processed-bybccfoldering@x-ms-exchange-crosstenant-authasHx-ms-exchange-crosstenant-

 $authsource>OriginalInferenceClassificationHGriffinInferenceClassificationResult:InferenceClassificationReason2Cl assificationDiagnostics2ConversationContributions,ConversationWasFocused4TriageHeuristicsFeatureSetBGriffin TriageHeuristicsFeatureSet:SharedWithMe/HasSharedContent,FocusedInboxModelScore.SharedWithMe/HasWebL inkDarwin/Url2.0@EntityExtraction/CreativeWork1.0xEntityExtraction/KeyPhraseExtractionPosTaggerTeeInferen ce2.08BigFunnelCompleteIndexingEnd<BigFunnelCompleteIndexingStart,BigFunnelCorrelationId$IsPartiallyIndex ed.LastIndexingAttemptTime.ExtractedFromTEENetCore_substg1.0_10030102*(_substg1.0_10040102*_subst g1.0_10050102*_substg1.0_10060102*$ 

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3IPM.NoteLicense URLs and Parent component details for Windows 2019 LTSC
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(FYDIBOHF23S_substg1.0_0037001F*,_substg1.0_003B0102*#'/_substg1.0_003D001F*_substg1.0_003F01
02*&(2PDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-
AMAKOTHA@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange
Administrative Group
(FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f14858_substg1.0_0040001F*5<_substg1.0_00410102*
%-6_substg1.0_0042001F*9._substg1.0_00430102**,;93feee6a76ad1ba6-amakothaAman Kothari
(amakotha)@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANMarimuthu Malayandi (mmalayan)EX:/O=EXCHANGELABS/OU=EXCHANGE
ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
01F*.0DEX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1_substg1.0_0065001F*E_substg1.0_0070001F*)
9I_substg1.0_00710102*L_substg1.0_0075001F*24M485893FEEE6A76AD1BA6-AMAKOTHALicense URLs
and Parent component details for Windows 2019
LTSC image6G~M{nHEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
(FYDIBOHF23SPDL_substg1.0_0076001F*N_substg1.0_0077001F*37R_substg1.0_0078001F*S_substg1.0_
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007D001F\*68%4\$T)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYAN<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.pReceived: from CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17)

by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

12:38:28 +0000

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

## Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version: 1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

X-MS-Exchange-CrossTenant-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-CrossTenant-AuthAs: Internal

X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:I;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

YHETYZ7MZ0K/UTgN3kr8V76TU9SAQ1CAdMEpJG659dI6WqZRgnboBe3UKWVdo/pefp/XD4l6GsL3SP5G+ KHBWZJp3c3auGfqBxZlOtnDncjFHiZZusfBKgoem7PDJ+3xSizAMmWTXICGIkPnrdn9M/bfzSID9CZtSevXk9v YJnFljkJ+hSlkY4y0Rn3fqRwUGkWtgs1552bL0u7TyxWdKYz2fvBCwTkfGjUHcTkYJADNZ9MGmZUf3X2ovL k/ZAtxW2Z0D4Ixr/wf/vWI6wvfGDh/9Ud9c5eRoJmm/7vwHByp1OSWXFetZYeA+CHmQjhrOGMiefIlCgbwtLcJ GfgL4yZbDwgjYDnkA0kK271yHAHUFqSqrIWVm2TUTQpAIxHAzOmntq10Z2XTD0sP2eUsDXoliSeBx3ZTnF hccFvXbdz6wVb0lIPJoTj+hvODA6H+5w/5lkeHyjDH8rLrkYzgMlhc4z0IRHKF3JYRj4G1q/mtp7NiOCefO0EhaR Q0v/YAb1kA4lilktmeCPE0aJQla3OSpqk83ou/ckCnMkZ2YRNGYk9A6vqGF5etofmlq3F/8dQSALQMkXfn4EcO 864kWc8GBKcT3jXx3kbM1pWAJDiTsIIS69yFi4DBJKB9jK6+myweLo12boJhphpDLF2ev77knTmj4ApoNAb75 gOIOofPOdIja1q77FBx7qq8Y0sX4RYZBvBrmIeR56lXesU7kmBlGa/eHcSgqNhg9hKaZXVZC3Grl9u4Fp4Bm0M Kugp2QrEAAM2aNn5pmvb1UVXR8+stxZhc9e7OBLFLXYC2hqWknvkWEetYmKRl5zvjlUfXtIIYLBRRPYGHc 5GCmlLHcQ==

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Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f1485893feee6a76ad1ba6-

amakothaAman Kothari (amakotha)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

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(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHALX LX

Salil G K

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Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

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 $\label{eq:R2sc8RS?h/2K79nSNjIndp_K>Glo@l:r>751&55''/-/5<dyGj#@SIN''T#@KX''v{U967D''w3#@%r-w0&;xk}%+|@G1@`#@r+{![6},pfFg4~85A<zxS@OTH&i;mu;u,5,o^pu@w?5&<$ 

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OPQ/R?SOT\_UoV\XYZ[\]nOoSSBOM:

a!o'@33pp13/@L|d 7uvw{|}fo \_oO"LM\_P0pstpHbNpxkduG-x34390267}/2pp329183d0mql-

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(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-

MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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AMAKOTHA\_substg1.0\_4022001F\*\_substg1.0\_4023001F\*SW\_substg1.0\_4024001F\*\_substg1.0\_4025001F\* VXEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANAman Kothari (amakotha)Aman Kothari
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MMALAYANAman
```

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan) a makotha@cisco.commakotha@cisco.commalayan@cisco.com_substg1.0_4038001F*.\_substg1.0_4039001F*[_<\_substg1.0_5D01001F*$\_substg1.0_5D02001F*^`$\_substg1.0_5D07001F*$\_substg1.0_5D08001F*A$\_substg1.0_5D0A001F*$\_substg1.0_5D0B001F*bd$mmalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commalayan@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.commakotha@cisco.comma$ 

ayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt\_substg1.0\_5D160102\*\_substg1.0\_5FE5001F\*cg,\_substg1.0\_65E20102\*\_substg1.0\_65E30102\*fh\_substg1.0\_80080048\*\_substg1.0\_800A 001F\*emX\_substg1.0\_800C001F\*h\_substg1.0\_800D001F\*jlY(!eyJJc1VybEJlaW5nU2Nhbm5lZCI6IiIsIIVybFd yaXRIVGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hF ZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[

{

```
"@type": "ExtractLanguage",
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```
"@context": "http://schema.microsoft.com",
```

```
"@outputVersion": "1.0",
```

```
"@source": "Bling",
```

```
"BlingDetectorType": "ExternalWithHints",
```

```
"TextLength": 700,
```

```
"LanguageScores": {
```

```
"English": 98.21429
```

},

```
"Language": {
```

```
"Locale": "en-US",
```

```
"name": "English (United States)",
```

```
"BestGuessLanguage": "en",
```

"@type": "Language"

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}
```

```
}
```

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```

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"@type": "ContactPoint",
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"@context": "http://schema.org",
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"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.url,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://hub.docker.com/r/microsoft/windows-servercore",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 53

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"@EntityId": "0d787665-7b59-4513-b6bb-c5914e04f509",

"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=0d787665-7b59-4513-b6bb-c5914e04f509",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

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{
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"@type": "ContactPoint",

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"@entityExtractionTrustLevel": "Unknown",

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"@outputVersion": "1.0",
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"@schemaOrgVersion": "1.93",

"url": "https://3rdpartysource.microsoft.com/",

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"url/urlTextSpan": {
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"@type": "TextSpan",
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"beginIndex": 0,

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"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://www.microsoft.com/en-us/legal/third-party-notices",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 57

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"@EntityId": "c5c5602a-d6cb-4f8e-ae60-893ce3f4b49e",

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"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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"url/urlTextSpan": {

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"@type": "TextSpan",
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"beginIndex": 0,

"length": 62

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},
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"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=13565f67-aa5b-4875-b270-a914e1e2f098",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

{

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

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"@schemaOrgVersion": "1.93",
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"url": "https://corona.cisco.com/releases/331413/images/1186257",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 0,

"length": 55

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"@EntityId": "af484eef-5280-4c9c-8ee4-26da2dc6f0ba",

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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"url/urlTextSpan": {

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"beginIndex": 0,

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"length": 112
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"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=54072ad6-cc59-45e3-86a9-13f35985a00e",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

}

]\_\_substg1.0\_800E001F\*\_\_substg1.0\_8010001F\*ko\_\_substg1.0\_8012101F\*0\_\_substg1.0\_80130102\*np" & en-USBT=0;II=[CID=47a795d0-1f7e-4d1c-8e8f-

7b6ee6af4813;IDXHEAD=01DAF2FD36;IDXCOUNT=1];TFR=ThreadForkingIsDisabled;Version=Version 15.20 (Build 7875.0), Stage=H4;UP=1\_substg1.0\_8016001F\*

 $\_substg1.0\_8017001F*iyb\_substg1.0\_8018001F*J\_substg1.0\_8019001F*rt&0; DP=1; QT=9; CPBT=2001:420:5$ 448:1301:c5f:d8ba:9966:de692603:10b6:806:fa::8SA2PR11MB4793.namprd11.prod.outlook.com04BCAT=NotSur eDueToNoApplicableRul\\_substg1.0\\_801A001F\*N\\_substg1.0\\_801E001F\*sw\\_substg1.0\\_801F001F\*\\_substg1.0\\_8012001F\*xx

!"#\$%&'()\*+,-

 $23579:; <=? AEHIORTUVWXYZ[\]^`abcdefghijklmnopqrstuvwxyz| \end{tabular} ~e; DNRT=Microsoft. Exchange. FocusedInbox. Models. Heuristics. DoNotReplyFeaturizer+DoNotReplyTypes; SCAT=SameOrganization; RFV=1032232302:-1=0^-1927059262:-1=0^1146315108:-1=0^1810071250: sender-4814ba42-62cb-4d22-9bd8-$ 

754c802ce6f5=512^1352796317:recipient-2bbb022a-9d21-48d8-912f-fea5626843eb=1713^1352796317:recipient-00826e84-cdce-4955-869b-660b92e52172=2561^;SV=1.0.530.0;SN=DM4PR11MB6405;MV=5010;CT=8/20/2024 12:38:30

 $PM; ODF=Inbox; IFIC=<null>; HDTR=0; HDTF=V15420240627.08\_substg1.0\_8021001F*\_substg1.0\_8022001F*ubstg1.0\_8023001F*t@\_substg1.0\_8024001F*z|[$ 

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"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://hub.docker.com/r/microsoft/windows-servercore",

"url/anchorText": "https://hub.docker.com/r/microsoft/windows-servercore",

"url/prefixText": "notices and Image details for Windows 2019 LTSC image",

"url/suffixText": "https://3rdpartysource.microsoft.com https://3rdpartysource.microsoft.com https://3rdpartysource.micros

"url/urlTextSpan": {

"@type": "TextSpan",

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"length": 53

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"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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"url/anchorText": "https://3rdpartysource.microsoft.com/",

"url/prefixText": "https://hub.docker.com/r/microsoft/windows-servercore

https://hub.docker.com/r/microsoft/windows-servercore https://hub.docker.com/r/microsoft/windows-servercore",

"url/suffixText": "https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notic

```
"url/urlTextSpan": {
```

```
"@type": "TextSpan",
```

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"beginIndex": 210,
```

"length": 37

```
},
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"@EntityId": "474975fa-073c-49de-8d32-882ac6fa5fd7",

"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=474975fa-073c-49de-8d32-882ac6fa5fd7",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

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"@entityExtractionTrustLevel": "Unknown",

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"@outputVersion": "1.0",
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"@schemaOrgVersion": "1.93",

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"url/anchorText": "https://www.microsoft.com/en-us/legal/third-party-notices",

"url/prefixText": "https://3rdpartysource.microsoft.com

https://3rdpartysource.microsoft.com https://

"url/suffixText": "https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal

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"@type": "TextSpan",

"beginIndex": 249,

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},
```

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{
```

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"@type": "ContactPoint",
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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

"url": "https://github.com/microsoft/containerregistry/tree/main/legal",

"url/anchorText": "https://github.com/microsoft/containerregistry/tree/main/legal",

"url/prefixText": "https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notic

"url/suffixText": "Have also attached image depicting parent",

```
"url/urlTextSpan": {
```

```
"@type": "TextSpan",
```

"beginIndex": 308,

"length": 62

```
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```

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"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=3f608f7b-2053-4d99-9bbf-c513b756a88a",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

},

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{
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"@type": "ContactPoint",

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"@outputVersion": "1.0",
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"@schemaOrgVersion": "1.93",

"url": "https://corona.cisco.com/releases/331413/images/1186257",

"url/anchorText": "https://corona.cisco.com/releases/331413/images/1186257",

"url/prefixText": "component This is in reference to SBOM",

"url/suffixText": "TPSC scan https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom https://tpscompliance.cisco.com/compliance/productreleases/product/1343902673/release/2143298352/commercial-bom Please",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 456,

"length": 55

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"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=5eed85c6-2021-4430-8bba-7de5c4754185",

"@extractionTimeUtc": "2024-08-20T12:38:31.2876725Z"

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"@context": "http://schema.org",

"@source": "TEE,52.0.0,2024.7.9.1.V2,unknown;en-US.ContextUrl,52.0.0,2021.5.5.1,2021.5.5.1",

"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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"url/anchorText": "https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom",

"url/prefixText": "https://corona.cisco.com/releases/331413/images/1186257

https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257 https://corona.cisco.com/releases/331413/images/1186257

"url/suffixText": "Please let know if any other",

"url/urlTextSpan": {

"@type": "TextSpan",

"beginIndex": 523,

"length": 112

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"@correlationTrail": "ExtractionId=69770f49-18ba-42be-94f3-86839da8be1e;EntityId=40d18579-3d68-421a-b996-6aec076bab55",

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}

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SevXk9vYJnFljkJ+hSlkY4y0Rn3fqRwUGkWtgs1552bL0u7TyxWdKYz2fvBCwTkfGjUHcTkYJADNZ9MGmZUf 3X2ovLk/ZAtxW2Z0D4Ixr/wf/vWI6wvfGDh/9Ud9c5eRoJmm/7vwHByp1OSWXFetZYeA+CHmQjhrOGMiefIlC gbwtLcJGfgL4yZbDwgjYDnkA0kK271yHAHUFqSqrIWVm2TUTQpAIxHAzOmntq10Z2XTD0sP2eUsDXoliSeB x3ZTnFhccFvXbdz6wVb0lIPJoTj+hvODA6H+5w/5lkeHyjDH8rLrkYzgMlhc4z0IRHKF3JYRj4G1q/mtp7NiOCef O0EhaRQOv/YAb1kA4lilktmeCPE0aJQla3OSpqk83ou/ckCnMkZ2YRNGYk9A6vqGF5etofmlq3F/8dQSALQMk Xfn4EcO864kWc8GBKcT3jXx3kbM1pWAJDiTsIIS69yFi4DBJKB9jK6+myweLo12boJhphpDLF2ev77knTmj4Ap oNAb75gOIOofPOdIja1q77FBx7qq8Y0sX4RYZBvBrmIeR56lXesU7kmBlGa/eHcSgqNhg9hKaZXVZC3Grl9u4F p4Bm0MKugp2QrEAAM2aNn5pmvb1UVXR8+stxZhc9e7OBLFLXYC2hqWknvkWEetYmKRl5zvjlUfXtIIYLBR RPYGHc5GCmlLHcQ==ydJdEmail[

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"@outputVersion": "2.0",

"@formatter": "TeeKpeBondCbpBase64",

"@schema": "Microsoft.Exchange.Relevance.TeeKpeBondResponse.TeeKpe.TeeKpeResponse",

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4y@\$#&)67@9;D\$?p^@>A^B0Cp^D>Q`D\$RD\$W

```
\label{eq:constraint} $\% \& ()./12345:;=> BCDFKLNOPQRUY\_`abcdXYdepq\%uvwx \end{tabular} 6 \& 0\% 0\% 0[3^3@3Z6h6] $$0\% 0\% 0[3^3@3Z6h6] $$
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w6J#@:?? @?>?^?"@#@\$@%@0@01@04@T5@T8@09@>Z@7P]&]&]&]&

]&]&]%\_.H

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\*!0"dL(P: !"#@\$%H&'\()\*+J,1-F.N/J0@12J3456"789P:;<=F>?@ \$A

\$B"CDE FGf @H@IHJK@LM=

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MMALAYAN mmalayan @ cisco.com Marimuthu Malayan di

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_}+?LITiO{Vt:ozsg < y2+}Vlfw c.un9+v~,xK/jni,j < jJ%JKK,-+~X}
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   @ @A\d"
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  E)
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  E)
$@$@$@$@$@$@$@$@$@$PP(H$@$@$@$@$@$@$@$@$@$@%A9G'r03_e'>
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yb@-K.k
g}&H=b#%`U@(1<jsN+0adYtqH6yA:(GNp%{E|!K
e<Cg! @9N?jw"# "
QH
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hFyL+10?c

$$\label{eq:bar} \begin{split} & 6aT|ytNG<;D;8+YgTuSJe%2yRfMg1I ~\#/6U=z3@"F=x)IvDupTz)Ws@T1 lm(d\# ~*FR.K\$\#p'Ju4K_WOH ~~Y6\z(%`RSSN`{!dOE'{e}FX~Z\$) \end{split}$$

0obJ2\$"^x i#On:g4b9 3e`!eG# (|(k @8\Y

vZmB?{Gpm(Jt@hr32j Q+T O+A<^U6a=8(p[2>

\*1 KPF\$@\$PP(\%0091KLpi~x;M;4\*aAFFu?`v8-\*HkOfiw~Dfj#WAWWa3 ~oA0

7 +cP[79U-,# Hyfqc9Oc-k!i\_O#3//f|3[o@p

 $kUF \ @\ P0 \ ^-; wl82 \ \#pzg+f] wu \#-sU2 |p\{L\} > s4igbc.6FoV(H \ Z \ |^5o[:/_.[n]) = (n-1) \ (n-1)$ 

4cGu!6jI\_MN;SC[v}GH[of|S7f3\hktG^Hol4

; $L[R"?^=Q#>S_B?U = \{ov9c\}x!pU\&>bD]\}1Vs\{\sim \$ 

,

p@X\,5mu{m0tdgI~}nO-T

:4S7;r q

)&L4p6J^>k{14

!)f @HB p&93N;MwjGH/D@s1

`2}8B|vO

```
fFb3fbh)3#/$of]{2\#G/,+Wt|A n=4h P:{ 1$EQA uoN<x{O>1k8xp?\pVS8RR7vZ=AxpuwW^ipx2Ew_8Vu!#! ; Kxmu=y
```

l1cX/#<b}L;cg?<w9U\_?8#/GDTS~gy~<7xi+N\$ z

qd"^h})6O?qy%[N4Bx;e\{+K5/-C! rcrd=r3[ \*,? r(6?O2KU

 $D\&Y/;(8FVx\i9u>m!1YtAv$ 

(f}7G6mnt@F0:

]p,\_F

```
_-W% JxQ=q7 ERJ:'w[BGNcQlmscZ`Cq,3%J50#!8aq6]?X9U]7sc0-
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9evfO<9!ALef9+KXuBn{O\$|~GwgCa)SBB/Vff

s} Xn

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+WUkUon]K*QnAG!XYRVU! ekyeWZN$@$)
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q @ 1 GPpf E\*Vh9MNjUSH70U ~ [3u28W!7frh35(q38B!

01^8X0

Q59Qw//}hr !ft#B<Pe~Fm0!`p{-ZQPbt/ z8?iL?[15sG

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) B'; p{\sim}LI{>}fsl ,> !jVL@i \}{-}vfo8h\%nTVl?ff\$xMv[) IeeG
```

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 $803B; !At \ ERZ@H8Bm>6; N< DkP|ya \ V-`Yge \ Fh \ N>3M3QcB; x|60K@T"yj9(HgH`MC > 38/f\#b\%O^VxXw) \ Author Since the set of the set$ 

 $\label{eq:gov_teo} \sim N[q\{pGOk]G=^Lb+nA@pC^_tEo,7mBxM\$/(+c4Wwm < \{HH$ 

7D%S.x@mN;1Nns;72"jjxe{5CPZyc

 $6UaAa4 = fsbJUbYau_Jdl < POOZ[>a_WHIQLk:Hpss]k5 \setminus F \sim 8pT$ 

 $G\{W! 4dBem + jeOv5uI \ tHH7zihNz]Z\c\%; YL\t\&C_y, fE < e8LL = LG\`\}3"af1N.9"\#]7Q8$ 

\$D\$XE:Id:A%\$\$X!n=?~|3zh+W>`@(pu;s"3U/D@^?UW][P\?>.w\$eX98z

 $\label{eq:solution} \eqref{eq:solution} \eq$ 

Ww\_UOj%Z]symB@jcb9D=RZ5[.yLOVA-

 $UI[+mmSx - ]] $, 8D+e ] r9& imH+Yn | 1IN8O8 | VVgr | $fn | 33-Uk/HfdWG0 [Sd1] | 20g [kPe {dsz $Tuk' 0-sg?n/mIH1}] | 100-sg?n/mIH1 | 100-sg?n$ m5ZTZYn.j0vy'G9dvwg#!M&Tt>LFA\$@'@A @>(hDYpA8 '[z8ViY:+(AO7\$N81[W7 pL1M2W.\_~ 3CH0k,6?`?p u;(1::&A::N0<NTv08B3]ZfbQ{rcpl, f[1.B-a\_{+X8} m{YafB:uRNep8O8QJ0vCj@A>o=;{k[ogA(G'ncRD={Q c]yOd?v@e)mg<6+/O vN>OmEGdQwjS7q4\*fxq{fjNuvfm{U{<Kc; rUik6E }rBNab=r\_dc0PLvlh f{9::-"vg,\*lSwZIM[3e\*=2Wt:,&8fy{kz8(pf/^?snRpt lEvdGw=E]ZN:GhLJ]x6%hEn379loY]^E\*\$O gZ5/mA\$Xk%dn]]\*eY^Ju7[RJ oy3}wH\$@%`r;WD p~eLJ\$<.tr7bga1cb}f"?3D]-A1BN&S8!mQ:?6mj(,]SX +C8Uy5nX0Woz\* 8uvGAtr!\$N^r'n6\_bSM pVg}|uy0}\$' at!v3MwAXA>C/V!YVto\_`.30~v="fw81+JqtY+&8U=je+P-J@u +jEd8Gdm'K^X kt[n3c%?2T\5ygEISv\$CF|vJTy,1 Udz 2ix<Dp05"1s:e#nuAu"^\$cWwL=J2,c#8dVKJG{+ VV"&~S)QsTd=jUjTKlM{a{HcV9#mwj}~&9SQ"6R\*\$[mVvU7m,ANWrJ[[wSh\$@\$@'@A @0 ec.A.N0%leK%Mh)N339DGx7f;0 \* `=<vPVOh dLc)Wz bqrtmDBb#g.lW87#Mum`6iu[gp\_cwgU:9>7 fzx\}a!VXc5@63,/e3?^Pu~5 [1 I;Fw+73&9O2 fxl3d91s//;em,Usq\_I.Vaf^]XcF6BU!WV:\$C\_W9-vYZjH`Y>gv[,;P^h(^]Y S^Vip0olZS5NZ=h^mY!L`tF8+dP=lB^ Y'DU\$?(U\*cjKPJ1tOd^0>R\*T J&{Ko 6eNY ,~J?] }.9hyywfla+~ Y2[%+a=+|E, @\_& \$0+s70 uLBSqX>}EcvYIKutep\*8ap}X[ <#]x?o91i?)Mp{\_47dRGwD|OwZZSR~Vpd+k,hsvdRu?;Qggspm.BlUa\_V>\}YbvJAE-n+&uCeZ"~o8[Zu8o2,-]Ib|DV(}PFN9v} 2EgCV7imPK?\fJ)r\1UUv|' @d# @~so .D6.49mkWw8^MfjuRi48Lua!Uq:'?#tur'# ;uA0=CVgeM[oY 1k1p !p>];F:[p8eBLE= Jf@Yf] yh3ZwDX;y<8qcJrd8.#4C;`Z Nvx5B48YB EV6Yq9Zq ep[5.mt7>\*d=6\*Q<Zg\_&k[]B/y,rC,tdpF!lW;Wpm8.K.0dpaJt t#WY3s~ 2rL:E 5hD:X^yrgK2Y~m 0 dU V' X&\*p>:AUO'7|c%16 8p\$-^1j3+VHXA:-g]Cq,t=@G :axUP3V '"/XXq#nnPXmk9:s }`NKrw(ae.=3AV3C{6B}6q2bL ;%D;qA+6'X)HK9;.#U8oPa.?=kd,V;>!o:%^X%Hpc9Xw\_05J,I@[7 uAYu uj r[Cr#ZR 8g4/#enae~o.5s VaSLrFZy08[sJl?mn^urtwTZWCa@?@'p'(LwCqy7HCB-8k%5k?Q)x9"uK%96T7O\*UX/Nip/P ^fd]<.(VcP/j81JO]'TWA s|HFQBgnqqC''\*OnkpW|g^qqLUP7@2y<W9#\*J,?V7d\_Yd\_UV; \$rIS"eiZyi;JJOoGr:J\$cU)\_^C\$[f Xp ;Wx}Ug%?2^ 8qzrRSJ7sq@ol.S\*\$@\$@PH SN9E;Z8 yn6I@p<gwH"{&\_X#W3x=p (B8(\$-;g|e\$dB Hfln5 %\$\$\${a>o=BB /-/IZm.~\*aCc>|110\*8rtu\_  $u\{)|*)fV,dg^{k};UW\% z9umEzD''L<\FUpuzvcliX''*e(Tb);zv\_wuUF>L:kvstrqg79*;FzahvGSlir5h+P6gH;\\[YG~\7W]$ ^JCCoQ\$r{pWybdjQjeEK4m@psH1TI,vmzA)[Qp6 A ~q1xV% J\*Iztyt+.0i

?Z`c)A^iiiDooowxGJAPp@9# B}}i;a{pc5/#XK/lQA(Es!E H#fY<qNZ@p mL\*Z@o-X Q"wkYaR:B[GZUJY\*v|I99`GX45;M`\*`y9 #5\*Wp]"\_<]ULc)mq!C ?9FAK^=>U%Kt//1WF}Xt5i+Wt~6 @r>8UIH ,~ m2\$8\*8lxX \$cx&aigiVmjjRt TWv#>sf6AiYMG.=.\$B~7C\$ L]vVp)))sYIM}O2E6G G-||gTnZB2l!Q+xomN<Z|'C^\* '}\*/]PafYNisvY+'uW!6|Yva]S u#i03;RfztyAGKNKSx"v}XBf[P/XruY=g?jWU7/3PR.1QK | @xwk @L=@IDAT^fNHep06kL~ ;d\*iIGp~vyZ?0+QFr+>83 XY8.SN2vX|K,\*4`@!CX/\$qE\z8MA@\z WPpmG+rDb>c\<wku Vt+a5[1hG`y'|AW`RxhB>?xq{=Vw[^1X4HUcnCx5B'haDNA19guo <XN:va<.boUcg6h{eaLis\,!y{d;KrmLyKyIh}\~~\_n,g|N!LI'eRikv5LPB21;?'\*HnmVwj~ i[]VU+/U}? g/6MH Y]&VVI/M'kC^%Uy;=6p]>kbM]k-8U6n,;w(7)=0h-2i@3'4 P (L/^,pzOquUVYdppk% B PH9nsAnAi\$=4+0h>1D\$SFhP\_pOuST) !9{]y|,o#l[x!:A0J&17ZG;Va<+r"5z;w+P)AQuo&GRQa`i6d%\*x:1ty\xU\$CT.M;w#fy n +'2tm3Jifx>N\_s\$yt] 7>IgyiJx< K? \*D!+2v|t6ER: [O/{d) 7\:\_5+#Kf1mSQ,VlQ!f--|%D4;RoAHpy9VYtx:EK!'dVTBnh\_"[H`u=mMqr%YUROh6d KR9HH"#@A 2n<H 'Mr~:G>`6% 2ipd"Lna,C<;hpye-[466%KUYz ~ep Rj a" T lEr~D| ^wy|G!D8rkHZY rSHw}goqpB !s(Z`wBuj +^ziZ)YEA +r"]|"&%{i~C[~(:\SAn}zsAtQp"INVY\*pBCKfTc\*Qp//M1#?z]qXOT'gHA9|)<R@ ?NM?KJ{6HJFK"`TQBV.XU\_Yc5(n;9=3xS?Hw<PR v`S \$'6\_vyGEVZMWF~yV~ f[I1[!cO~&D.'?xOS5+@mZ I[y2 rsm iC# #f/uA]IuO# 6g2!LH^D6x^xn8RC)t>t(9cP{Wt M} `FI/]h8d `rC9yR"y]ko-[6L@hAKr`\$}v:EZ!L/o]}w1R/bb\_8N:C c0 YwJ5sO;3UN|J '{=r>aV urSs %`8\*\ W,mHJ sJH K[CR\$5 ^7U5oIJ\*u=]VJZl1:YnXN/NJYbUc~]{\*Kqd)&y'6fOJY5ZLd[KciU.5dhmbj9%]{ujWKH\$ d?a XL\$@{mBlx!E#Lj\_lg9=+!Q,oF? O8Q[XKTX&CP}o/v.s"<:Pu~J+ O\$.B"EmGyT?6p{uB=9-[9I'L`#i|=Fa"W~Dkva;/A Dm1\*AWZ^bLS9Vm!Xw \$zq1VIeG'q!|BNIaNOww%V(H]%`z(S&Z/M@d@H!+SxzzxxuBmyPUGE@r`Tp|cv=\$0 %CZ`n7>b|@\$\_t}zxS \*]j^91ElU9BLu3g |fQW>rwhZqn,kv|C8!TU F\$@\$?i @Agv~(<f:}S1{4{\$s>|xP,wn[nq~O9 :3wE> eX503?/gQ]}\nWX2E39@?+<y6}>\$Eo[za! `u]q\_Du{: A0 J\wubokXW/i2q]aLg!\*+|}eb9^{b^+hv["8,Y9Qk8y/-@}FSH4<^bG2~`&~b{,|.u~kns|RJ9D)-[e;F ^xyv~\_\*;\rCd7j1x+K;]%sC[GUB1 +& p /pG\$@\$e]Z-/ euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh  $A@6[yP|Bx*Yt=<Mp@='oUL.+w}*~d*y]g+E#*\y+Q#^vk7l_~=G[6c'?]$ 

5~uE 8CYQn,qn3g]tfb}cQP;^,\_=c e81LcL+g;;?j1<m<8

 $!P49Ss9JRjGh\ DH0Yq8p]b!\ m:7\ M/_j9\\?L-W!\pNgOIOO\\,36[6.\%\&nqO"Q\{\ \{\#\_FFr.xLMTy=s5v\{rq!Kq@ugx\}\}$ 

 $L)+Lz{Gsj23>Z;[qmXyYBe{\$@E]gY1rCOy^ m7_SPdMD\#=\%coH D@($ 

z ygAakyK7Lh;X:\$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe

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$paUzy 78?~>XkWc0`&n'_Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6)__)VqK$A
pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:${X#(0#THK^ gs\gF|7*NvM$@$;\!;~<H
r.ZUpUT;vt9Zb!19PGA3^~C>14>*3fp.Ua :z)>jNf
fu~
Gu%u(+`bZ 8%`\:"q|%T/13g"S
,An?+G?c
URx<0;wn9XPNi]jwK:D4s:U:w5-7]wXH1yRhcKk{(WJ.9j&y:bd %Jh6fC~goHq'f#|n
v8v + b5jlO>z /
!b[Oa$q
cimc=T8PZ{U+
Y/
0%uKG-*#F' w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg
mf' }|wY,v|<ap3B@ASZ?!
! ~?
#8VBX@[B`O?<
33u'|_yQ#86"_ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
chqyIHHH6
EIHrG*C#?>;bB_~p2fK#/j0JFrN`kc^06lu">&M6c[nP}.H,|lUV!8a0:99nu]g9u,U7$7[N+B
+r2@Bf.wSP~*QpGpp\Y\Fp3o^a+uU,>#+yv4V\1|\P\ 0\8.dYW\K2sf"H (d{/EuS^w})
P"7k+e$j(%SRG;]]#++?;6h`8eR$-4E*mT0a$ oHp"a/a7n~#1Nw8,Z(w]>F[$II|onJS4~GN
cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$p(S"
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
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   M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH$@$@$@$@$@$@$@UXH{[NrI9CjQq$@$@$@$@$@$@$P8 P(&c+W#Fq/l>oF-[f0
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^_mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/}z+VVO>4lN>d0`3>
@W7xCpp<\=4kQ:ukg|RuSSSs~Z K/MGRF
>6mZa_?IKKw3QFe @11*=md{/Eu@ip>LId}Ye,\IA[C>$Iz\Q${NA(o;pNn }
9j*)VX:>-(*
0bC
mqF]l?2i$;w.>SO=%wqGP9
&w)9%4AmKN?t3gN>.7xcSN(vD/\~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+_`8
"%\bgbY%ew{,'{
6>8
```

```
usx-,#
       "P HHL|{W_}t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
g:tampVC tx/#
fIY3fnu
4vXkE^{;}Pxqn + NW^{f1->H.92+n}kA
!L=Z h([t5>a7 `@_,X UFXmip
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiYjF8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K |0IHHHHHH,h*
GVeRm$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r
xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK_A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
T[.?x# r
O~" @!3JN2U%r {AeS3d
[lq
j%*$/un^[|r-x:)0#g@B,z3zjor091;
y|0D0(C=$2x%p`<`T1M; rB6g11# bXz={CrO$@$@$@$@$@$@;g
H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(_[n':Q5IA0*_fS0nV#NCY_+WsNK]Haa9
8 p~ 1BH
fxC:F8(6b_lLizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku_aqeJfcpA8?$uM[NsZZPFNe!f&X
83
GcX&{`($@$@$@$@$@$@$@
#Jg1q W%\$
@;J?f#W7aW"QF^BP9@R^sa &*`yg$0@[o0C-?)k_
g_hmf8mBL|E(F [0[00v
V~!zCNc06
HQ)$@$@$@$@$@$@$@'Ag3IF24a6N
YSP1e?K(IM"o)0YFw
Iux^'XaM4I0b&*6e^2fGz6Ei=5=aLD^F0[$ aj^!F|LX6I|a1!*<yqtE9g,$@$@$@$@$@$@$@$@A F,A$pu/
N(Z>}b)[Kie]pB8::ZL|??6l mu'1 ,hB4i>xky
uky/Em{O>qk}unAofb8BM`2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq
\%8w@A
E5P_veyk3gbC}-P>kD/oO?
o<LG<G!}7n[;#>@71"
x?\(-3&B8YF wsX9-(ol\kfU[ZEt'8"dh0 L F={o)_
GKMkf<c360|;1
,kN{=]$6^^uNh1bf$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC
I/b#?F
wU0b}5E|rCa`FA}R|fFmV?G87|WP%Bh4PZ$p`dgB8%/Xg"O?TI}Fbf$xA1a@"n;/G{.>^p~E~WO$EhzJ?HCNII6=
dnrHHHHHHB JLr~EV<sup>(W_s='&y.$/7,[%,<r<3^5aDJ*>=+JW_}Utn7U0+PC-S7!T0]]?yRS%-~0G(PWp>QXZJ</sup>
}q0:!)`5>mm&Sq!00b]HfPHHHHHHH|P5.RIrf2N-z{Ix
w;=3Ycd$rY6B*IhQZQj/@<x(0sN9pG%Q>:wFFitE~o[6<x7#:!%!{xpi}a(@H+D1`6I]"R
   `+rHH$jO
w|Axke!<O[*@%|41P)IA|
#0SY4m)fX?
             TH4T" s?aHHHHHHHQcPJp8)BPY]"$ { @ $aUjDdf`ORHT
JXDI$@$@$@$@$@$@$P1 A @)jL %)I9zU0TDb$
```

{\`!aun\*^}J}\$<Th(\$@\$@\$@\$@\$@\$@\$@\$@KTB #gJ\*Oc@Pd!!@@v,>uJA%-J2dgHLW3'0Ac@@:vd.)X;+SN0 0J `ZHHHHHHHHHHHL8IW( @IA^ (Gh(G71! "@@Ie\$@\$@\$@\$@\$@\$@\$@\$@\$@\$PPnB\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@%E\*}V\$+}`R~quYZ: {"A>m`\$@\$@\$@\$@\$@\$@\$@\$@\$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII \*I@ `oPC}zMOV%P "M6I (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4  $7@q({OCYrPRN P}t)$ 3GpNb9!0Ac@v2g8a\*}!&g+\*^SAY0 @Y`IHHHHHHHHH ΡJ %>& R"@@)f3\$@\$@\$@\$@\$@\$@Ft\*@IDAT\$@\$@\$@\$@\$Ph(KIHHHHHHHHHHHH @YA,m (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eIIHHHHHHHHHH PJ %>&

@YA,m (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@<br/>\$@\$@\$<br/>@EI ,g\$@\$@\$P K]2% "4PMHHHHHHH Dba (j%z"&3S{+eGOC7~=e`#%~\*[

tI:uJU N

-LR/

 $\label{eq:w7Q} \end{tabular} w7Q & @\&@@?F!?SJ;+M}'ZS$wL:Y7]'OI ;CF.?fhUk{+%&Kzk(A2%HF-XUke_ri##I4S~]/Z<%"<gy,0}\ThYoM* & @YA'(29t[N{;?P)J[65-[)}2<x_~Zk_$dKRbS \\ \end{tabular}$ 

 $NW*Kt'Ks0w3xI:\%++;\_`gITYnfM)zs$ 

:"}9y2{whLf,ZV O@o7x%5A! D

Vk!@\*Udn

 $PZ;vL6o,|[>\#=[r+VwY]g_]|(ZtlJc/P[-ChR?XF\backslash XPb0>\{+l$ 

pIt\_s !NVTZj?s.3= O#^qNWS~T#

 $\label{eq:additional} eq \& @ADr $, \] qlN:-[1c;%:#w(=[6GD[x'pZq>qIxa7HAxWcdU%*R@wB$@$@$@$@$@$@$@$C!I( <uCiii0P k_ (ymJN6MCaoC!Ct;k/gb6*2'B)6lR)+jdtV({Az(c)-fz>j=TuBNU0Eamq)?[fI^iK {b})}$ 

hy;+dX,P?:H7z-jzB?W(s/+WukWV?F\*hs@KqZUuN.^ia{OY%9?fS} y569f#@?v

v(u.YllO\$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<\*tRSrMg!>>rAVr'JyYYd1IW

 $Vu{IF3\sim Ucx}z^MY>@>gc7>6Z-R}LoP!/Hc[v{]&$ 

(^4/OF\$P \RR.]>+ygedYzo6^BxRhuRJ\$~F'EP-\*HzC2"SiiI2WQdRJJUINa1

 $\{8^g Hv \mid O=6\} > sT2Z1 \mid j \mid j \mid b = 0$ 

]m#\*U\*>Z(N<~BQ::7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS

 $Jip;x\[\] a~Q,2U\%vra7G!2<~qj^vv\{([\Q_ks\&uxhlC>W>XKF$ 

 $96\[2QrrlSV,wHPpeA\]@B?^,_Q9K)+\]VA@pNxR^{c}q(w?Ir+_r/~"*'N\&)U\]p~Uca9Q\]<\{29[ezcpBavYKzk6I+7HHHHHt8UJaB\]@\Gamma;\&:$ 

u7EIFd2ydGHa89,\$@v

90 I&<W\_y $2 < H:PbL3wy < xC^D+U$ 

 $\label{eq:kprne} KPRne[q.c@!rMJrX)Q&rkGk(/mN6\]m''K6iEk/\}y\v5B=^6Q>2.rR P:U LQv*2\#uyX<)cv)n2`Dq5[d5aTdu4k8PM|zt OSf;<C+H7o-S\%womh\[yVJe`Xn12ro2kB''5cVa]\},YF)<,vntU+'$ 

 $\label{eq:alpha} $$ q@_i.SUy[?ic]7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2]) $$$ 

\_PQ^v

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~xwppW-8Gclv)j,]AXOWwnfnx&~6W[u5&0aU\nmVw:24L!j%wVgcGLfOVD\$]~}gW0cwiJArbYD|-IHHHH 5

 $\label{eq:constraint} xw=ZOHHiBV; 6n6ydui&iGNoKq2O\?~2KL<C.(SSjeI_;f]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}7sS=HuO{U]#of.:#Os_|BvxKIr AxKPWF}]$ 

>)`\$.\*PQ2:DWHzNJ0{R\_FiD.urRFvHduS5|E/

`6e.O^=:qk

<PFV@ :f8wfe]2zfP6??0b P O3@WN>\*t(&(\*=wT<`s]C!wa:rZyV3<B3=pPe(mBySn`\*\$YRB7?N|:U?Z^~c=05\*r~SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k djNE<zJ0`F [Uiy < & a8OuXV`nz]0.,||3CD >\*J\$@\$@\$@\$@\$P\%' p=zSjc ,\$F0K\*;v:tPTXv+I.J \$&0g( oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc]#fkXblm1PGU YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]Q GdHE}PZ#Od`uG((!69u<ho7Q8(wi`'/\_U(m'{Wu-Ve})V)9rb! v+`A{o!k\*OPDG|>z}S Ka\$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 \$8p+I7o x<h df`<xl(]AjdWra oI&<Oe73ty#Oh61oR3-GHWx0?.E9tk6{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m&\$x\*b0;x{Ktg#k==\$8G)3i1u(e)B9Iznxi':.\$FtlcV,r~ y? ^v 9mt(b&/ga5tP{'i{w)O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj\*rq=;:PKzOf m<ru9)GxB\$@\$@\$@\$P^nlH@(^Z &~-[T|nvYtiA&W\!y9=\*/=BtR'6cUum5TXc\%fwy(\_7WJGaWVeLye @3.v#\_[Y=r12zU-F7mUV\_bctRD\* G]1Mx#ERnT,YV.tJ~XKjj+Qy'ty(dTnr;zY'N&f7}wc \0 [])(f;:f2UU7r?XR1\_VCn'Td\*xOxB1~%0OGcDRd< 8\$16-O8gx~I]NaHLC!  $(76B \ @\ WO \ gIT \ y_h \ 1y9z \ VrX \ H\& \ Py \ Mae RCbTd = \ 1|ILIi0wzA2xyC\ WT1, I]o = S \ SG] \ LrC_swX6]^Sp]'O \ varX \ VarX \ SS(M) \$ R=Uo@?Bv^qQ+eam'WWRrsH]RMyD8G'<Bv:% P527GsdP>>K\_wg?T.f\8!"V5/oUr>oF%a6#-0QY! !@@pf+\$@jE(>>^>} d>9q D&07] iQy\$X>co S}x2xX\f<}[5yri2{Y>MdyaduB Wb8BU2y 6}(/KhfSRb,?Nz/'v)#r!f?bF&ic8tl2uz}A\$OX9&wIjg(0@6nYP"c@joFVLJ.%wqr\*jA#[d5Vm{+7/&O4SI{ ~O'\$5(SS,Vrs~Y3 #@@fK\$@@tt6\$'{z(!lk7C\_"eA\;2d2!\_3CX-k>/qA`s{g\*sscZ} +#o&/g!L(3JMW=19y5 b4ytW0rkB`ZN<)P?\$[>tnQ\*-S]';R#BB/1U f dYHN s;De-DFFHrrXg/Si ]x.U((#fB 1hVc&?K3o6SSF BV Px0eh/e{wy5B\$@\$@\$@\$@\$Pz)=lH [u/Zv%4win dYHQUrKRdnNt\_.=n-SE~<16Q{u\M;3Mf.s \*HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+". :mP!b[zDLUgerJ\$ddV ? s.Q5u@eG s@>Z&<-<qjo Yvni> '@@#f\$@O>B3 t[r.o^{MRRRT\r58/FXZi5cV'%gWs\><E~]\*B^#W+G;flwPA#"W&Ip,2 r\{+)/ ~A9pLyqj>\/.S/y3q5\*\_A=BuZy- $BlR!OdEnfNm < :: 5kBcfcf5O+ji?4J9 < \{ -Bv'u\&R]o?wS, [[UcV*oW/Eq0] < RFec/d$U(-bv'u\&R]o?wS, [[UcV*oW/Eq0] < RFec/d$U(-bv'u\&R]o. [[UcV*oW/Eq0] < RFec/d$U(-bv'uR)o. [[UcV*oW/$ \$k0D%\$9JA;k6ly%u]\KWvy2Y`\*w<O9+;;{& (a40`VO\$Pzue)rUWo;sg5j!l\$ $nSC + = "fJ(Q(@).hXIR39I>Nn)#c0_H < SOKr?[pCQQN^{{}f*T}Dx^{(2_ts]c2kKjvP@BUc1{?L&}#GS{g}})$ '5 Mid8M~Zu/s  $P|W,g{ch/dJ}$ 7s`.w^I4]CT I]{yK}>\_z3e0', $[AA,/UkISgt\eTnXK _#v@y]$ c|)U[]]"]7ca]^Ei]f9cRop\_g1`Kho{Ms'%)#{#\$[#!O}Nq}Y8q[5016one<6PyC>{mR 0~!V)\$@\$@\$@\$@H WQ) ( IIIysUwQKSl=K/k[ozX\RYS C@B!o|\$o+zm?Q9C.&SQ\_>i@U.(S~Y\*I k,9BTw\$+c{2'pxGWc0V3^?Zw\'iO` #o{-Y38\* t%X@8iV\_oyQ1T1?j \*\_MY\*W3}m5F.epko?V<(|\_MG <g^?a\_('xD%gSeN\_|/)j @ U%iSXVMd:\_{}+mxxQmCem R%q1n@ 8lSo~mwx+NEs8)Bgco8~2n7W:|t4egz8ecM\$@\$@\$@\$P

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 $ttY2@:b3R6ctYWR1EIgjFevMGw:TP\%aIyTHq(<\!\!yM'jFvN!\!\mid\!\!0JO8N|^{1}J:rh@m\{rJP\ 0Ia\}$ 

 $d|Q`w\#9.amoaeSHj|N2\%qM\&rOI?Jd.?u=5fEySgl6d]g4O^{},mMGU@@`\K@`Pn$ 

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xI @2AtR.IO) @\*b; @FdNL0%fLX~x2(5ysN5% @ @y

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 $;m[^{6}_{yYw}@\Gamma le:-kt]$.eZ]> @2?@^wP* @N^A,_lW<gJ[FQkycYo:oWeb^{26}wzc.]$ 

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\_rt @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ @SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @ @:Se @ @ @`<h @ @T@@SN @ @ @U @ @ SN9UF @ @S@@`<V @ @ @N:T @ @O.ZE @

@ @ @N:T @ @O.ZE @ @:Se @ @ @`<VgU]w]9s

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@,?WfBls'G>kil'<?sy3!pgoY/}:ew\cl%wHgwnPZE @ @ HFOC[uYMs80|4eyc[k'em @ @ @

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 $\label{eq:solution} $$ <38\vem9\#>\Rn?.w)N=S?i2W&u72)i-\slassifter {O>LG?QOY.? @ @VX9rM7MjllVSV6@IDAThd\u]'I $$ C&8=.:rr'ub-^<gr/OOG?v\L0"cc=!w\4KS!%7iV_6I_$ 

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 $n? HGyd: ZS''H>>: )M @ @C`, t/3fMxIUSK'zRd {-I_,s1Mhw'<) umNQ; zw_<|mu3AHI \}c+V4i|_O72wA_2oC-interval and the set of th$ 

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&7 @ @VX6|)w^\$PL3HLITK6Y88A;s<1ytULY-1YNZ>uU6(\_{+yoNISP @ @

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@y<675gro{Y{[wkYs5s3AiGzD~U?-\_hnc^W\_]LN zLfrGE-Oz?!G @ @X

KF7?r1L.#1e]?>w|?`%9w'0p

74Hfs'-P8mIPfM7mvK.Byf!@ @ @^r;iUzU3> k.tMoy<OiL.O{&X(\_){~}g''#ke6 }or\_tB~e,5]Pgu[G @

 $@\_oCcy^{(z=yrI'Mj/-*'_)I?2vmWnr/&yew/x^>tdZcR''Q\% ?VW^7~:IStQG8d^2c0Ae^xM @ @O^Y/W_o:SVaV-[6_Nn=+{Q2dd7<h+_Jr{?m^?CIQ[}~r'-)z8\#0k_r7Z^C)c}$ 

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@R`W(9|fmJF/T\`8){NPmq2B{.wK=iu @ @X'V @ @ @AGE @ @ @`,k @ @ @HD6 @ @ @\_@@`\_Cg@ @ @F

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T @ @ @`, @ @ @ @ @ @ & @ @ \* P%< @ @ @%, /S#@ @ @U@@Jx\$@ @ @KX@@`\_\F @ @@H @ @N @ @T\* @ @,a%|q @ @U# @ @XK:5 @ @ PG @ @ uj @ @ @

 $T @ @ @`, @ @ @ @ @ @ & X @ @ @* P%< @ @ @%, /S#@ @ @U@@Jx$@ @ &KX@@`_\F @ @ &H @ @N @ &T* @ @,a%|q @ &U# @ &XK:5-?,[lq< @ &0<% @ & &KU`R=U=v\{Zr!e]vv+ XY`*?V^Kfr. @ & @-?OW W\qE7-Ls)~j9DR$ 

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 $orGO\& \}, O'1Sl\; rRC \sim = yOXe6^{*}K \\ l6uO|cmY^{*}\{.\}w/O \sim g54; 3|-_yW6| = :|F| \\ F = (F + 1) \\ F$ 

~\_m7RZk??g=Yoo'W $(C=t)s9_;6M9NwY$ 

@ @IYJ3Vnu[MW[wuT{#'NX-ei^gz

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 $sJ\&1N(o]_=awh|N_]; \&55zSuda\&*N|Vdyo=[w"#c%UYN|eO-CkwK&BIdh @ @\yJ>{Wt8 l:}$ 

 $l\&=lD\#o?['mn3_b~Y''L:W:^=~u\#h\7q\'yuOoG>2|1L~N)?5\&^WMda_D\&?n^`nL^j''a8/~$ 

 $T8 \ C5wgL9FO > C(/~f^nk\&G1mR.h''/j=^@dG \ @$ 

 $@NHZm|i(\%Ma3R7\#[O]p[$=Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oa%s]nVYF}]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oa%s]nVYF}]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVYF}]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o|oax]nVV]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[V]]) = Chc?iOm>0$ 

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 $mwMoZ \#e^{[N?jE/j]7xy/|W^y^*\sim V} \{E7Z'N>l$ 

]

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 $R\{/ gq <=\!\!F\!\!>\!\!3Z;\!nwk =\!\!Dqz + @ @VY`PUNsM\$[.'/lt2gNK/t7aLw4VM <\!\!le{\sim}ihzpWM =\!\!Y\&k + k'u[n9uRSZ = @ Marcological structure of the struc$ 

 $@*n?Xm\%)D+-m\%3-I\ fr2oi2wlqkt|$v;K0gK:g\%?,MN>3]t](Z\{ramC\%w6dr\%pG?$niMQ @ @ffactorset of the set o$ 

 $tw]:dsi8W \ 1_|g9V9W^R::. \\ +m8g/2xqfN3 \ xdJbJ < 1M^N @ @V] @ @`w^7((ML \ O \sim d=P[h)M) \ A = M^2 \ A =$ 

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7lml&UVH}c+M6|`Y%kG?Z<rFmQKVv6xJ:O;|SCp !yH9S[1 @ @

 $t*UM7; ynvR[oc]_W), orOY3; LxdfV[cLTs=oZ^u]oo\} > 3N:/iGqDy~fmPdN2iB @ 0;^k5$ 

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mx^VnY7'Eewn6|^Q!?tfy=>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0/|/<o

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@ @M@@`nnVI{c=v)Wzs*zlS_$Mmnsrc&=S,||OKFN+iw[`~Z7q7/|yX9I'4lpeo=[~T|y?% 'PJ@fN~6t}']u-uOovaYgU<o[|4d29tvn--[GY<zGn= @ @@
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vYE:|\SUCxFySZ2`zky;YvmHtT/3wu&Ib:o6myTZ+u9\&6)9udCh_|X9_3|\&'w'okL7)@\%\2\%IQR=rm2yt:k^)u8; wN;mr\-\%[mxp+g]^W63nt[2:U|nIvr-g[tnMys'< S>\% @
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@^gJN[l\46,nm:FNzRbwko]2qnFOw9:>:>]Y|yIt(&_yrn>mn55H{hsFOg6`M6i.hF$*8N$BSz= Q E:
@&"E
AE"BMHH ';?{fgw~;39EyI5nY%8Ju70dPH`QXZc5Bkb4)TN+{/K'G)u?/`'tRZ;CsMkD4_~YjtQPX{mw.6sT+J
$80=)<WPpW>8a[DKo=EM
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{Pc[5Kv[yiv3TRks%mT(B*hBw(ZTR!vRkykn5y4VZN
fZhG]vY>QP`@zZ-
"4Q0`Ev
`{i<)P,;g-FI}e: Zr.RSjK.k_=OU_+r)_(wPW?I/E{I3B6|*miRI
BR:hNRltn;fgT~9"*+10:O}+(\&8H GY{Q =Pw9PR0TR/(A~^t^n|HW)1ZNA}
a\b:m[1=saZVmm
c,'iYJEIc8?
K-TrHRTn
-]&[oSO=#yCW^ c>3585R>*MZGA>wP, |Ks/laBw0_ME
.w!.>4h^]`pvJYg[iL%me{PXc.T]*i\h@S](ja<Rt;y9MJ*QR
Pz
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zEx$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P*N'Y7Zf{w5XXb
{oIr/lxD@@@:I@c
hZ\pA\{B
6@@@@]B@]tn931e!v}h (@@vFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9:G
u-z'O.: z@IDAT c !@o\p2X@@@@@m7r @E*ba@@@@@jS@m7r
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3WTF@@@@eCee@Vw]pe4K@A$]?t]"! @45S&&V)6[@Q
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wxuB@@@@TM@L2FQB@@@R@[j/hve<v}ogY=8v@@@@9
P'|j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p)
+XzZ6XsHqbu'loMkpMR?N}*va{g
?r?S^x4`mlm;3OrG;tm{}[o=klWc9&w]&" waj+mq|8{L,/&|]rO7:d
a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:17'Mb7D/o=Tgm _nMc x9~;,h
U3Jn]w7N<Dqme-
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f'' i\% | e0SL \{cL_v\% B-XSO?Wsy^=Ozal-6cL \{k!msfwa;`\}z^z=[av>=dwf/|GvAJY3\% \wUW]f\#<bkG~slZq9~?),6\} | \{U>=*KH^{S}
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 $i?{\sim}A5@YnP6l!k?t; C![[dw8^5W6zSgnZ:d:D?iQDUi^{}]Z}QgTj^v[?/"Ya2 @F$ 

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y)0k,eBJ$k(]B0@BIvwt'z6lM'w`)2xp2{=vW}xnw^=bU/''V^{i}E;h{)i/p-''N;-i}C;h{}bU/''V^{i}E;h{}bU/''V'_{i}E;h{}b
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n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v_?m2`g4)yo-370"~|m_
Ao{We IR~e<5>|Vif/cv4
0
V @@LD6>c=Ca_{[`@?_8].+ PtOXf
'Ndl%QG
@ }ajoI>x^e~_~n7:{1A0 J`
[K<t"
{/T>)7Ll(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[|!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
FZO5~z, {!m:^B><Dz^{}\&+pIZom[[n^hwy]qo @i}NW]?vGrV?~vZkfg5x}nz`=
4h5ao-L\QyOx]I*}q^KcQ|=cvL?w}]hytV:&e/c|^1N}-PF!~zcOJ
<y?9zva9a-g<yX@@@:. |1rnvRK-
wv%4j{GwL>9K_6X}U/i?>sBj1UV^;a'n]sy7nc6pz7YO?,<_!Plz?D>[vi_/z@>`+Z=3a
{CG;b]]U>Z
E&7VZfnlGkXVXasI@@@@@Z3<4HjL zoTZ78oGr=$ N,z2j!I}f?v'Bv~
A?dv}oNBd~9OnnSjg]_y]o)j)rQjuuu>a
:JM0!~%Ez?LV9Tjm
ue T:@,6@7mzG==&~r8:LO`cv{<>y0
@@@@#DRfi^[6|}WvAs{7dy|5iQ)it0 L*=^|"R:`G}O6y]u
6;;U[n|m<8y<92o\{(c+.:cmZOLmD\{I=Pj\8\% g'.'L;x5@*Z=/i<wx)\}
D2p<W>~{1z$]`Y/tLyIaoHarmWxS?g^{5l~Uw/2NIapxWLOG=a7yx^P&NXb]=.5>nLS!$xjv#S_x*\-
~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@
.RE]zC(:?;C|Ja'5
Tdu,^qufh}eAG/8iV6q<{Ly =_4i3lvlsYMSv[OSpbx0`9:G@@@:r_|q{KM^Bljx;uUWY
1
klOIOWd!'Zn.P`_^z{H;l6FN9j*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5:
H:196
oz;k/= fm/
?|;r1Tk,.8!Mnu`____{6*|:Gq4p77m?N[>TbK$!
5W{Wg4( r~ s:a~~=j5RJPo]/ol` ?Yn64@@@@H<#1
6(N;[lAm9n5GW%\<y/}{i>Pemj![{5')@]tAjS~9_lQw8{?.IS@`u[=9cg~gA5"><XMVy
4&Iw_]gWqa@@@@|.57kv }+N>;^)7?{F^d;mo}mZa_FJ<RxF5d^0Hp26+[.oZT`Bc(-
Bv{CRK_~5oZ[#?yzeIv}tw?m?z~<dv=oI
q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG
dZa>d_{11Hx};+c((G)|N.]^{200}|yU^{uh3lLe}|6=tma
35OM{Dz])]zi6),[50WWWgG@;=Id@@@vwJs~vM6B=3f'H}9$` yyOx9qo-3g}I}8->nj{%^Kzn4_sXfUW}p6eT
Q??aw!<cvo^qA
;@A-a:`]rknkZ<D>.c?_:K.Q8=J^SO=UV4f5j}D;L;+{z\B!+~:8s{in|/oWlytVwLz
&2`x *a}A%+fut)Sk*wMSO?k8&;{Wpgz]"2
;{fwujK
0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B
v?5)yzO'K.}cCWEWTm>xm;'f7[o{eYO>b;#5Gy7J]5xO<Smo%kCoeg{otOfW}a*/MzuAX:B`X
>I
Bww/k_<yd]
8~`^
;dImJw]t9)b}
```

|CB@@@:@N!wg

 $7bSL52PRp^{E}(Li_N_w-[1N;l|b&K?W_fW_{}!^{C}dkzzs_{rG}vp+:o5$ 

 $<6[m?Onw}wZv]$ `\_3o7>e'+/e!d.mruzKK^L|U}u=B=m=#&\#/l=2@@@

B +f TBY;)s}0qfO?y?5q;}<

}-Zj\_mn!<a7x8fc7fr7hn6xE[j~\_vmXqW^/\_z4\*jgybO

@#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8\*\_@V,<('zuYO>uX:=:~

z|Em

f^v!}Wl5-oz-c~@@@@@PK5!0mt+U\$ZR@c+.^R\nO\_]+

6grsRg~l=9n2]w~zK.wo\_|%g& @C

 $=xL3f \sim S^{5}JS - (0gNBg)$ 

~[\*;\*hV?}]uUvGZy@`!w]r% @@@mJnkw-

EMBt=RYKm;ng!#hx8v&{)b]tQ;A@@@jCqj"2KA5q}&cWAjiu4n8O-(Gd@@@-

u}nOaEK.wheUW.d@@@@ZrL^

 $hKm < 0- m)-w@3g{gZ*J'}$ 

 $\label{eq:constraint} $$ '@<U%[|gmQUiW_]v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s]4Fe_|E>}t9ri[IT@|Y=chY@@,e1 Xr%m!vwyvgDo/x;umege>[j_~e]P(7hkYf0`@c=>h@N8[uUme])pAp$ 

onr}o!zvXb ;\*8;`&

@ h1J6;w}>3SO>92R{~Bc

6~8t-n}Ut

 $\label{eq:cappa} $$ $ c-gFzg - = DZo = cjvA/l. Vwu\% ?og[m] | 9sBO?pvGy/byZh GU`+Bhu~KCv : Z''m*s = 8~H; Sa Control Source (Sa Control Source (Sa$ 

@TSr-]ae7?dwjj^hD=M@[

uQT{K?O]ZO%5ZkFKZ'W\*W@U

@>6zhIl sN U:w}s

-qy4@@ :lhSp'W\_U6R=mmbKZLw]H7B}?tv5K qA5cu?vu u?

@SN 4(7n.O

z0;C=44A]s9^+h3iZ@@M sk&YD&%jCYeY9n.(gbsP]5y\*g\gq?ymqc M6-LVAL^iim}yS5Y2y

\*{HclJ5PkGkAD5Joj-w>~jj\N>9Oq?X5M%+/<ukM{@amu}gCD:AIg%0lZyD@hmvqEFR9?~.0

 $\label{eq:stars} $$kW}?GyL[q2,X+i^E[o;t?O@C]4mnv,H%vum/GuB18*9C7]OU|\O??ePUrK\-T&et{\#}9U@H]E60_>VsxyJY $$mdkjZx?-RW_~_.IrwU*} $$$ 

 $O[Y^{4Ht}[D.(K['xK^{U}]7]oVZkJN}GmW_m]vBs{:nn?7f;cm%wS6jtF}KU{$ 

D5ur-\*M{X`J'4fKhneJyuS,k~6-

 $\label{eq:constraint} $$ qt @ Q^Uc>.y<wNy!A^?|#q{9^pSGmJ/'_uXP&/L?^SXr1zt/n^dyx}y@:y<wm?<^xh_}m4_:Y?Oe|2i0O/O06Wj&`Gqn+hy^ QtwC?>fonKn} $$$ 

 $wO^W^/wMhM_Q\#i\#/+xN'mg6+*t>P^]rd7a$dVg'm;>Cqra.LK?x^@+=+<,WFm}GV>j?K/hO'Iem/+x!\#=T7yr@e>vR|q$ 

^s><pk2^Y0?^OG~<`,. m^:o}|\/>Cy,{ :-

vE1\_G~/qu,(:lkPi-<U<@|'\_\_t [{Y sZl!,@@Z\_@MJo?T0J4?\*&i6T( mAo^ky,,a#G|

a\*8zAS@ATA? 1it+^S+// U}9[o1Gp6B@@% G6|p^-((({}?W~kg&}pj9?UWA

### K)k

Ztczt@@[o

 $BC! \} < ]OTWTX \&yn5/{\sim}M{>}VFtR5 \&dy$ 

>U^zFM7h&Toz\*1w+:3t{+!f+?}.kk(`h+

Z O~UNwQY/z0O9jV(\*xkY;\$SeXiDi,W<VP#T!@-uXC"NS@-

jA}2}~y/\_Wqe?la7uT+Dt}1TAV@@J@U|keK5`@4T0G

I5CR?TQ?IyajekY>#w^&}dw9F~.pRLLJ{P

yP!NP\*k%H\*+2YmvvG?QBtE\~XF5)m

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y: Pl}%
```

?f

LLt8j\*EzX\* +jSkG~xXF\*TT9{

RqB6.)h]zmI0k\*WtRpLt

8Ic5OIRX|e-XnBtJBdige

j{Nj>tN^@TQ-3[VoguywwlAZi=]]Ae\_-T3\$\_3i

<SK;#-"

 $\label{eq:start} $$x>SVyT`W10/"`V^T@#~ZqItT @//*ubqjA<j>sux ZCm]1?-%T@Sb7KtRK.lXNhH6 =+@, $$$ 

 $0N4 / b\% Hyv_T1!o < N=9_A\%..P$ 

lb)v{6X\$"ps^

 $LN-jeTN\%*W, pZ5g*e@s6+{Q7/U5eky}P5UV:+BN:(X.\{\#\}>\%T@IDATUT?\}S`$ 

n\_nrIT8KR-W{>c95z:PQ: Pebk}e;-quUl>VEreQdZ/RtTs

 $3WXy{<}X{\setminus}{>}T|"@{\&vV"Rs:'*Uk:Czy#}$ 

7xRyuG<>Zpa4AR5Pbj0/Bym0I

/yM0^{5~0Ii91^\$y<Kfx!rJlyuM5=&iZK^`e

N#n: 5?A5bMu $x@|r's^<ws41ymq$ -

 $@\#, \\ 5t: A`$yO/9'}y \\ W''=0 \\ /M/_5]z(G`z\%81, Mk\%uBd\{tUBUM8i<`j?[\zaya5jTk^Av=nVrz*i&O@0L:~Yg'D\{5\}] \\ (A) \\ (A)$ 

 $@JZ?(\{YpIU*uOoy4Xwf\{-+\%]1QvJY[k03:\}\%?\!<\!\!A\!\!<\!\!2pYzyZmP$ 

Yq}\$c\$, t&\_9fgyuox|SAw`

 $]|R@`o^@Di]\%-T|]7SA[ytOb)oui$ 

 $\#5Ov)b^{<}Uf\%{>}1.\_Ftij@5{+}\{w)~b|L_oIm^{\x}c&-H{-}[$ 

RI(Z]lB]\*|'3uZk>J3c!hv-u.CA

CRhV[^a

 $\label{eq:uv} UV[U`4lS~[X~Fm'7z?o[Y5uy$l,>A]0]1]cz]83QR7]'VGJ, UgZr*xlL*Z?\{*lyzc9p=\,^{9} '@@l; \{pL*oN|4Q?baK\, O8Gov`oB~k!\}u>^u^dk-Zb-xZk?x(^;t1mq-V~rSM. 'U?$C`ZJ[lim9'qMm|L{Z*0L5*UZLU^cMRv^=*W@MLn ^P} ]$ 

 $n+x+j\&{sk}$ 

 $-y,lk7j25j\% \ 30k \;,iU) Mc-8/c1mfNKi[[;^{``>Lt-LS+&PTcZ,g)} Jw[yUzn@@ZF@8vRN`r\%^?Mct~~,iU] \ baseline (a) \ baseline (a) \ baseline (b) \$ 

UXG7jzeRJPozxS;vj']xnTUR)[LRjW9Z[{8:@nBZu bMP+>Cjv^K.Osi1n\*Smuu'

T`Z\_sBM:5T?//S=unOx3jsg6Z]x SoguU5Wxph+v-Uy,\*'.W}){/)B+ZkPV-^

+u#:4Ku%@JM0uZO2k1iC@h!-6:CKugbUwJUit^jGTV

?5WI,tJ/~Pj^g^=WJ|mV>mWd\_{^[Knj;S/

)+@ ZO}n&EsV,-xU[ryFR6]N-q-B}O1\Smwx8G]qEYbKKu/-v'8Fj6,|>t=P

 $46\{ijn\_nC="b8Jm@ZSu>xq)o1=MK"JVh \&\$1\%6?\}iE](vTTJ4DkGl\$5*"T/M".RCI?c\_1], C@JN1NB$ 

 $+ ETT1J*XzsI\_, \sim J > Td1cnM4KV \setminus R[K9P[om\_|q{PQK})ET9]tVYWX = g'i*XH + v_o1R + t$ 

Qp2/)`Z6)P{

U))'Upm"m?u{Gj!nG@@ 6b/PQM'TYk?b5[8PPMVYoyI?TIM45c6qcH??q(hR3XRIkT.dXhzQGE]LdF

```
>uE%u]:>JB
E[K5+?SC![W#|h,=$/g}T0r(oRb7"sn^}0k^^TMn<0<!kU
*T!
65(R,/j?:/F0+QAz]FsQz?eUVm@'+~~[>:S7vO}?{b8?>*>GRR!*.%]
SUZ{^t.)K\zhx/k6Rk)^JZr=9wX}olx/Vj5.QwI~,BC1@@uKbUi#uAY+2mkN>`#e`5^),?
^h iK\d9T7'Z?L/(N5#?{wAV_
|[Bd}b)YW>9#x?f<PQBdlyYxa/(xMXfis0Y k57O@s
{|SR>dW\qE2drD/,y02rA0k+:&o_`S?mb,x/hkm[4 ^c2Y],eGe:?}Lo
9>F8s/lpz<=Fu}`7Z_TJux/yk[9kswWO^{IEljW/p.xkl^^{gB^u|<dk}}
Rr2V^{\}[3] Rr2V
k;)~hc-u2@@VPWU%U*~XO5^t
Y}EmNlq~/xdy?KC5mz
^{*vy`7bNuBio|*H
YGiubA^:Z@@
&)`
TBXpk10>P#nC@5?}ULZ}Vw,\PSTn@Nm-We^Zk`{zh/7l5n*4l^Rt\fM7[$L+UXX9Zss>py(Hup[$LS`)~e\mx
>r+~[>+
`i*yY
*LsHeT}HjIb=.pW9UCA6J;-
Uo[y6dHjz
:L
f+!Ts
* '=C2B'W5Yz:k[W~S_:d<A@huNvNOjG~x#ED|0PN5IA,hPxz5i* 7T&ov]b B=s85Z13!](S-t~
bmOA
XG~pQA9|`vCh!Ki*85UEK@@kpo2"#`5G|K%.RxI(,VM/7 Y?#
*W!ZQK9'q[i
[; MZgTTy*z, {J?
h?-sSjkQz%JXJ*SIr\ONA]|&_Wog]!}V5]WK=
rV>JF5U9#+}7PAZ6{$ <<}GL S
E*.%PKU(J+FZ-[5
+gyfA!Jt/wtTQlmRN><Fc @f1~b+y]SYRvp@-?*Zi7
(f{MzB av46P?-_uVzygfiqyY[OZ{[E}*+/zj M/D
w}5jW'~
/iZC^(jt.#'K4,m|.rQqjA_|?mSya^=}Bx
 V4 \rightarrow WyT
sKcoI+Nnw<WPg \@;?Ad(xDcj[
I
d`Wz59J@@@"[@>=
t6J> 5,@@OYG@@@@@\UXZD@?n
JB@@@@*`JX@@@@@<id@@@@@JT* <id@@@@@JT*
   <id@@@@JT*
  @O=g!
5!pqj"d@uh!l@@@@@v!@@]2
  (a)
          @ .N@@@@@@uy 8y*LC@@@~>uG(@@.@@@@@X:h@@@@@
h]
D@@@@@;u>9@@@@@r0@@@@@%@@cO@@@@@\,LD@@@@@c XA@@@@@
W@.@@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\,LD@@@@@c
XA@@@@@W@.@@@@QX:h@@@@@
D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\,LD@@@@@c tX:5k^E>jDKK.{X#& kffigv!
R]puz.E&@@@@e|aOasjz7|0d=
```

```
We @`vj'jksUNDHI/ 4_@X3%krk
qiituFB@@@@ hke4 "eUt])
2 T@'=-} !YKo! t`hpY'$@@@@Z@l:)Sly[Q\("`{^cb4Fc7Xb4j5*1{
o}>n{9sJw~s\@@hIZ6,7|\sMIM0^{m;m%s3@@*!/?Ywt\44'#GonF9n7&O-B}:TU=nu~b~tV[m5Kk*@
@F<Os6sAwn~u |
f,W U#lCWd=eT{mUW)
}o;e^VX~Y[j!e&hw;N;zCo=ONoKh8_3;{6qb]zwdCll>_YJ&g(}]{;Y?fKyzt = zxZk-kmVc=6w_!@ @ `Bj
6hzGK[6~]r56nv|hN7~so^M'=N:6>S>n
_{y*/\&L\&)tu}{G|9^[/]ofIvR:gxWW''{2u5c'7n7}~7'&y28ze]Oa'oN)y:$7N9~m%(Y @ @
6Xz%O\|%WK+wg."mE)wV/wcN1c;[ljKlSNg{GahpY,'G`_k=wm^;vYc;nuzG>hDr2+?f*,4`A71`/^|U{C_Fmwf*Z,
OwREr
v;![L.\1`UiK/gk~5uckGL+6x#}|Xsy{Zuuq7>jtGvA3 30f3a}74mnw6ulCgcfU0n.v]wI'& @
 @ P"`Hn_M'FF!4/-~fk[z=sM6 O?1W. #c{3nrMk:W,:imQK+>}7c
/gsoP^};bAZ831^fdM:_Vzu$->IC@RWFn=1$mFWn]bL:+=v]|O8`4>V2;.E0O7xh7Q[=pr]M#"o_L/]fqe|4;1q3,Q?;
@ @@.Rs)S_=g1B+ ehv's8k:rhv}}`XbvdkzXm,>9<1gO[neMkLnqrH!Fgz3/?g-$=Sox?g=c@\'7|!iR vXo4Oyztz,jg
р
% @ @ C I'O.mbk?j~1[]eEZkVlgE'}aOd\^6X]F~q8blVnNkWJ+X>tV>}"wM6J+r#({|mtvXt
eYA^9 gEXw8V<
!zMqLNlj\&+ww5|f|ov_>Tg^i7@k,z'.~)?'o~<yvr86w@=lW;Y.2\v6x:3fG?qE]dwq]qo@@4F
W]?z{7A@.c.{AnL8#uos
3f@u*vqGa`L
oEX_j!r$QP<Q!Y>\%]V.s|oqnTpj}Z/Cj{j`I,|&@1/+at?>.TR:{g~h2>FI^{4;Bf=-}}
}7[{lm-g7@ @ 9?v/
`/=!#GwAIy^juW7rF*CW_XO?_ynyr'V\a9[
)p!o_oq3w)oy@`/CROCYy?7.g o$l]:n{.N$k,]}t6+wYc?QvE}9
7K$cfuq1@:?^&Y:@ @ 0E2>IS(|Dmf -C{n{&xN;1?)Zx'crv\v9T?fg~j|m1`/{a%evn+ymNu%(AgmpD_-
36|m] < F \sim |I.e|f
hE-Dn$|-{|nZCnc
45<v}Pw'&f\iD)3nv[AT}\g.Wd8LO_/AYv?AM+B @ @@@#jLi6,z<}7v>~
ME-~`1 K L=
r{NwE$9^ggoW]{wv,[nV^x1a;I5fhkXnNvYl<c'~igy}i<~=8p^19SK>j?pXuI
d
Wbm < *j < w)
 @ @H/(=q,K?+jqy~{s~a{mL+?yJgg*K < {IK}w!w~4}q}I
1p5IO+>>
6j d{jcmuL-Wi~4^pX2<ERV`y4KL@ @ P@c:V#k5^zbFM^r3{G&w 8mXz,K(%,^=h~6Cn}N=,+
R8W_{..}fh~vBfd~lgw}gjzOP\&CEo0a7~7M+R@h~oO:==?8u2e=gnRK[:M%doo}>C>@@`C",b/%v1,-(vOMo.)
zcG[img+V|Ov_X>zWuJ?]tih!gg!!/U&Zs.&3U}-nv|sCAkHct4mf3;Mbg]p6JE?g|&Ky_wr2ey-@@{
C[nisOW&lR4nrxoNQe{W_veY.>,oP)iSJr~8^.PoSk_$[}U2iGquoAfHX{5a.11WXonZ^hMbOvQg%LB}:G&|e;y}
JP;f5hNn3Lf+ymeH98pqv_{U'''} @ #nuQ}q6p <= 2jhCP_)R; 5h''W_ &H%W/d]t > V-N+g)P^q#CzJ5b'''A'' = 2jhCP_)R; 5h''W_ &H%W/d]t > V-N+g)P^q#CzJ5b'''A'' = 2jhCP_)R; 5h'''A'' = 2jhCP_)R; 5h''' = 2jhCP_)R; 5h'' = 2jhCP_)R; 5h''' = 2jhCP_)R; 5h'' = 2jhCP_)R; 5h'' = 2jhCP_)R; 5h''' = 2jhCP_)R; 5h''' = 2jhCP_)R; 5h'' = 2jhCP_)R; 5h'' = 2jhCP_)R; 5h'' = 2jhCP_)R; 5h''' = 2jhCP_)R; 5h'' = 2jhC
{k^H,T$fq Gzn=D
:i!vP=13)7lUWnXc.M29LWml+VhG%" @
```

```
\label{eq:constraint} $$ 'j:t`<~ZG+SO>mtvz)XZ<Gl^zd?=0mz2RK{zy~l&Ct^WC~t.<(5L+e(& Yxbek/rMkq2dHR-zd9|=bl9+gd?n6S1@Xq32_v~@ 8dA @ r$z,)8>{'mQvHb9c(D1bd\mtSU`WIpNr3Okqm.=}a{kdrK\b`[z:7`nW;ej;.<n-Yb%o:Im }
```

```
KluxvRQD=L]]T~[g'E\:>P9s1"|28< @ @vsoBs~
64C-)Ss7\&4Q;6[Y]781c}y[]py;]iEUsO[vI^\Oy6,"CM2:V]eU;o;roE.l'tMJZkPg)k7_F`FNy9jzW2]}{+{Ci
?.F'_Ly{["1utyAlUD1Z*u)0B @ )QYh
W|O?.GsB[zi
=
_Am.?.t^x
l[:cO-f]v/ecgWO<&}dW3O0"aX>XmOlukzy]Ng+vyg6(:kd
ZtQQU?=6w+{V}vMZ[vi'{j.w}!wnYw_-NXvU_=1u^{v.5}8uq7w_UWO-if}-0_ckk^{LN?}-wo[wusJ@VVV]
@ %P_;en>2/6q$,AaPqz?\/;FGG`g7LK/5/+^`H1A#[v7VV[ehzd}tL+-~Ps{3t5RX F\]f;`>c'xM<
\kKilYbo}8Bh6
KvveXbX[Y]:100z:wV^G/[~[*]WPg=4>C k/)@ @ 8yGU:G~ReA?ZK4i{}
Hh}'b/|.ju+40k>o>_5z3l\K)h{6WV49wp@V[9J[m*,
X &/7n3M
s%
x7mW3k{9@ @`.'>e.> 0CVAVS=A?_x^xV_}MU({DfIOL#vip&O,{iwygX~,!@
'AeP12Cs<'lo~:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @
P>+J 0A^{F0}
tJ&k. cDYsb<}gq#Gc^;hom `rH-C @ @`&9+F 9sf[h*u%YShB-dmUWz>4/npX@ @
0C}6z{QiAmIk3"%\2=ztLb^~e[fePh
@ @h_!Wnm.CKJJ3-OXn~1@Z+c@ @ 3@]lA+7/<411"-a[@ @ Rv4M|5>,AwH1j&hBFW @ @ ("@%eTw% @
@@mC6\ @ @ `hS@ @ @jC@mR+ @ @ @M N @ @ pV@ @ @@"AM@ @ @
J @ @ 6Ecj
SN>c/xk#M @ @";"f<c^b7tvU'v:\sMr!!
HhOqL28&2,3xZkm8}z8hI{3?O<>#S]!~
```

```
>E @m"@M& CAl;lG}}&O>".ZN<puYUXjO?h-M0
```

```
mUW{=}z!Coo{=?}hV'l{+}7|KX{=}mu?O.0m4lwv)Ur
```

RKnhzk @hYZ7G P}&O?]c

```
+A):AYeo04g'Md7p5vu:.\,x7_|akUANv[xfcvj/f
```

```
yA. \\ \\ 1=z?o3aAg \\ < @O-\_\sim nfs \\ 8P-x \\ \sim VPN) \\ @\&M_! \\ 9lwu \\ Qvu, \\ HMst \\ M+q \\ Jd. \\ M`a7ki+r8 \\ ZUI \\ @\% \\ s1-T[)x \\ (b, 1) \\ (b, 2) \\ (b,
```

```
ifw F?a \ */Orxw v rUWAUVYV_{u+!} < 843SN \ 22l/0d: I
```

```
@cKZz]FKtb[ou5k1C[-!-Ac<c\m6@ |IF#n`r#?
```

HYN;-VmK/

^7zrDq

;`Ljo[g0)Lr

```
@@`ji`A8XZs7WjA}~\)NjUsr:[Dmc47Hk"5Mkuk2yu&>yELX{Jk7We5hnLyn~j/frYykP#$r_"{ayrkGqGdc
?|pK-$b(*_;w T:H@}@ 0.v{~gb,|rqEgRu=LU>rK?hWKz;\"L-]Nb}IJ#V,MV=ck bX`kv3<[,se^xrUu1c$|C=4ur
&I'|/j{}K.d14M<wqWG_z(!
|G[nPFuh_{<wWLZ:'pz>o
#FZ. ?m.F_r%E'o_d'w
c
's9IR9K(F_>k[
$)$>'NF_XRF
r'RnQJBr
kF-}/Vr.L[o4=TXguKCg|UDI~|6Y^1QLg$r.V_|qxK-Y']_?W;V[-SQv}w{IWT%{Wh~:~8rH;lA|Mnk|_ 1-
m^:z(fmVyYi]v[X4F2~E3@.h]%gk<~wIL+w2<\(A/!
@% d
8qB8>
XN5!*o?+sr)u,WzU}2I+L\o
```

```
J6ktW+
pМ
d[B>y G}tWGYpe*|wmW\'e+I
A^W&Jd;/oW|t[AH]!Qp:b-Vt_Vjo}&[BNt6]pe78FcG;DI3r#L:
qh
bqeJIDl(xPX<Y}
+B\{y,]vi\$-x^{\wedge}
!O?Jt
nNK1\=y+6'Yy]XpCW<H
r}*nMzT^ 1
n*.8^(*)tg
/g += \{:=)K; bRS'': VZ^AA^..c
tcB:vcDtB9chY]@h:|UA*|no=cJ)(i)v!!>)(}D~A?){VyI?R+:6d^>99A=*(PNmH> ct2pR+//HQPDt#
RxKP%#>>p}Deg[Q?[XxC0|tfY]r:?_4-Y2H6}i[n 4Z-r"E(H`2xe
"-jo1.o]tAA_qbSFK)GNm:=nhpetyFF))$O
z > 0SLh/i > + Q > K3
>C>o)+U_5RF`13txMV<VF*d|I_NQ'm4ln^zGO'[%O@Lu5$e{Yi:?jM 2(A_K>}y!VyvhPu
\{\%\ 8hDK\ s22\ dE\ s.>\ k=+>c1ylVxiL9RA
>{{c-@-C@p(#Rj'c@v%l3Fh>$@KCFeUg$@fyGw9(#welvBYI#FwVIL+D&F)qJ`R?ofKKwI~/bZAe41-
iR7JA%ig7[M$e#)Db%-jw{,_vRdFSGRrRjU*w?<kx8\J6.6Kf&KiqLyzj)gV4:Vy:NZJs7Rve
^\>=1h4C2YU&{Nq6+i#f'R*XRg<OVQYkOn>TeTVA@2y:Wy
<o&C43m11
*.|VmbYJPKnkPh/6SL<&i<3.
hZbr
]OvI|F76CM'AB)7U
sg\VOk>7bH\aei?Js% }Z5e>Xb='|rHQ }w+
WPJP{$a=l5JUn;sClv:l7ee v\;ZL}tGR@Rq%&5uxxl[>64P7{,dEA+e,o z|C~Z"OZS9'?TB,E
I@lmL1T|U < Yc5WGmsXD + %{>E~R{QuU{.c]b3}<m}
0/BZ'|E"?kw<R^Sz?]"b03a[tgEB3(2?Yb&g+pmkPD.]N=j*6G
a#45WuJtVs
Q'UoHc7xKT|#)i>!HG
F$g
@ rj>[I?ALuJ|SLnAGCtN)|~:
,@1?i%d+Pc.O\J#KbPrM"B4(P]{wA@J<VWL*b1bUMEH^Vz9}L+*ilcz%vw71x*Rj,f~^9W
(R]d$4]k.
U8O:1e Mkz^K.#+<#=x>3^\*JsS/V)#$[neXAJ3iV*3 2k~VDKFz* V5W[IgR|RoYvs<;];]R,b\Vs
FzG7:u mQ|F4dps[=>|R/)Yg @u4: @8saTjS<bd!S(wR/+^Yi)^"RI$MEmM7-V,(Ug,_`
3yNZ .)#'vk
IXez2I
fIA^l"wWE_c%zsneKKY0*W[kRu]4*V3)RifDAJOhwwr_aj-Q
_{iRKlwGf2`DQz)@[X+AVK=K#m<B0z1{?ok~&=w?4'}mSF{}W
z[nLxR3QRyK%|Rl-qVf,>-</Oc&Y")S,;\!1N|@ 0CzsM
6Re>d}$*[bi
1?7u)C}q;SW/Hr;rj/uFi/}N%~V)%Rhr$w@>f'gf/Jk)TZji[dA0RO>&t)t)2$no8F8=OYxIK
}RL[vM|8;aEfhFPctTjv@{%qFAZh\0Um"/!>8;#Ul3Q*y3bCwZwT`|W?R3S
w.tv8s1A!O%ai`tAKm!af@'MA9S
```

@3\*6W]ItTiEzcz &4)=p'|thVrFii\$TkITJt(V\$-9aLzHx97Fjrz4hk7v/e/r^dYjk[orUJK \*A@Ne zd6~@6kbc:Ck]

XE/[9)tE\Ri4W=A2hFgd,(H%~KLOV#Eat-ER{b>XOzvFjoPR5>iGs6UWrnp]eReJ

fehK\$D3oKQlC -)FIIRYGCEHiMOeT~)N)]^@Tiu[Cs7^7WUso;M]4{G2DjdF@

iFvtlQzk^=J[ySsmK3J\hwFPG+8v[n)t,?bsK)^=1"dMO|N]AQ

 $r\%|1OOn4G8s\text{-}5lg5BA6H > c < 8\{ td24H'NSRB3tMlSA[.z)r\#KP^W + @b \\$ 

=dtA @Z.Z:zZ%CSE>RI4"?-

r'!ED1R)+"]\*EDJu)

EEs1--v B-!9QR4u~Wl{Jo7}rK,>bF=xx)Ys.Qr"0--=-bAnWt\_#74 W=

H1j>k6dD5pGnnn(^34 +zg^pIr&k,n\*osT~h\$10pWbR7rMqRBhDJnqF3ed(3L{`=wry}.yaQ^7)s'u4k!@@%0TBm.G G|VY%F }guVU}UG6-O1tiyeijkpKhOgzR?H54O-WJX.\*QR}(R`RGAu-

"^krk7`\r~1=;.P<}\$R]/]T"s+,Iy"cFrK:lC>mV

K,SJIV-

 $\label{eq:list_star} \label{eq:list_star} \label{$ 

 $[lE?^{>:W"}Nr2/cJd]`\%?\%.B()\#>R9IVV^{y^{}cIg"}qU7,(pKwK^{IrG'a})$ 

 $qCEJIIPXkP \ axl.:>^>>i=! \ j7+'^qE8^wn-$ 

 $DWrniPgN rAQ|M!2[L|[]v\g4WL < e\aze;?S|x+B?]U+)_{\# < PF^{+}+Ae\$}, wYskg9Q$ 

 $n19YVsNtOV7?y]uO^{t1}=mvghBY\} < DRF\}Mu7\} > nXL \ Wu-rIzvONi(x3bs\} < 6w\{S^{L}\}:zJrqg|karrow barrow barrow$ 

m# @URtIYB03P9#%W-FpR>4>Kt@5Pc^~OcR;GnzrN}Rg2\$o)UAvEV-uKiefd%\*Nu-)#b)5b3R!|TiWiB-

 $l)%CRV(\&N{)I_5}vA7=tizkh/~6[RJ/DJXf$ 

7+J)}>Gyx/Vs. )G\_'e|{^&R~kuGZzu9ro,7`B!eTR~D^\\ yb>;:~OJ,zdHdXx7;kPqCO:@\$R2gE5Y~2f1Ik\+1 -2zgJ\_H'Ly>3!nr`yX\*P

 $\label{eq:2.1} Z@".!D>zpg t{Wp+M(obCA2Q/?V}#W>hc}.\nBH5$'R p_k2 #u&/B)on82[|6kBMU{+r7Fa*|Q_g+AMHPZ3:K>^b!WdWREC5Dn+Cri"W4c5z&|(6GcXVAc,<?\^ls)#]UMzF)MOXd5aKrcB\o2$tt\S;Am=9^}]3gY:<7:OZy9TkJd|Ep ^\tn~[>$sN.W5\%uP5>LaWfJWL!-y7z5z%R*r7~KE[ @jK`Y69O>/6h`5{tod}$ 

 $\label{eq:heat} H/RT" QM XM>MFvv"eBTH) > C>d>yn), 1EoS<^:/>z6/yI'^h; N^Q)uUs.KCJHX\_n5-N2JQZ3mLfC )ib[:IRcg -y(w~KW,'N 3#v82F6NOpv(.Hc K #z/W~jA<all!]Wkq+ WcS' LH : NIi& 0L(QD2dUUw[3wt^B m$@m@6@@']D.@@h9m2@@@@`9b@@@h}js@PC \\$ 

@ @ @h\*M%Fy#8@ @ @.\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J @

@ @\@ @ @@%0TB} @ @ @vvh. @ @ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J`@ @ @\@ @ @@%0TB} @ @ @vvh. @ @ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @XNIosl@ @ @@\$vyh4 @ @ @i04!@ @ @vyh4 @ @ @i04!@ @ @<jZ>

XM5@ @ @@

0Cp @ @ V`h+gv@ @ @jH@

R5 @ @ @ V @ @ j@ @ @@[!A @ @ @!5K @ @ B@[9 @ @ PCj!@ @ @mr&h @ @ @0.UC @ @ mL@ @ @@

`!\@@@@PCT

@ @ @h+03A; @ @ @5\$Ap @ @ V?&dIENDB`Screenshot 2024-08-20 at 6.00.11/ PM.pngimage/png9 A<J

EnUsI)-V{!77

 $4y\_substg1.0\_370E001F*Z\_substg1.0\_371D0102*[\_substg1.0\_3A0C001F* \_substg1.0\_80020102*U$ 

!"#\$%&'()\*-./10PNG

IHDRpQsRGBgAMAa pHYs%%IR\$UIDATx^xUOH5 (bG{/XQEA:H&#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a\_010 aL`0`ca0/d8')QO\w,,!%;5.Q'{R4om ]sn\$&&%gRtiZ]v'RJ5"e S"7+e]{HHH7hRZ51xYF9a7 L(9cwhz),,,2 'Tr97N<) 2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\,Br[18x'5"31\$3cr SR%19\$\$:q}uEE:QEt]JJ=[sm~\*zn7sQ~6L / 6u]'III~M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G)\_~z<o\_U`'>z.Ai0d%C~\$2gMC9ey'oV+V uU=OnfmB><32o<ZQ1+W?:WwG:7\Ciy7U;:u^[YT,/hocQF,k']R8/+=H3bDys<5\_'#@.x6vcw'JxG>kNm\_,/+H >a8IH<m\$Y%Av8]{`W^&L# n-vqq,ID4R 8VYnX1+~)yJz;Hmw>(cueaE0^/BCJa)hBK"""Te)re^z\*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF\$.]5/\_^/.S#/"|N=zB &Du 7H^]xzu3DK/Tvu\$\$I`RbE];oms F}D5kB{9MAL ;|cCoQ/I\*U[R\*I}D!GSw,<yS>{85.%\$cc;#u[z,uNPy iS?BoUB)yv\$+nz(U>+GI HPHTQyNuRSYP9E}~J4\*K{7mM=d[/Q?JrRx1iXw>5Hk?y0Y\_!F W  $Uc1tEF^{0}[nUc(k6 b)RDC]B^dPpMcGQsBO-4w6mTG\0wWQZ.erZhh)/yP7q7mN) d!F^{0} ]*.$ 12 q1B=OR\*n<pCZsHH rr5w"9NY0Y.^Ifr8&E</VIJOTX:&?!W)fy27GejjW6OSeo\$:b!=<1:mKw&cG:RCV}\:y[N6J/?%on.t00oe2e,)WDwcd =&0Yej(Q5BGC 64^w?gysZj7F F\02c;S"##5 a6@C55~xft1+5?;PIabL~~?j 4iDCcn5rkOC(&Nq\$6;GI: CP3/'1\$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf`iqqsJFxup\*8}0IZyOCI{H\_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B\*54Bn/k('\z `yA`rAp^\$ ru?h[O <-FVr3]Qp > lF $<\!\!B"zn~F.inXU|?"nlD}S<\!\!K~7:>iOOO||D8g^k \rangle = \#Jk*1DjH6m+-<\!\!>qvwUnyv<8]R`<\!\!8zYG^>Ai*w=w#v<\!U.JE@\&$ V14#wFlbsB~->[m2."mW#?R %M >5R!]Z90z?((C) uM8hA?  $\label{eq:starses} 1_`.XfsAXnc!6~lb=(3^Y9Amq;3F-{je\%6.E;,gx|QZ\backslash1!F\$7DzyW|;wgh\-TYN[0'ieRPA<>-$ ^\*:vm2>&`TMX0W\q16\_CE( CLXXp=\ B > Ak $O(O+k]zC[1g"+Bc]/b+L7[a*<5y5xG%GXF{L}]{M"8675}]3?tWg`i6"rzW~Cn~#<9$ 'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt\$BE4&)O 6q?,\$@^qC/>|; {~9r4ZyUm7L'5/\*#}\_zB^yQi Q&Y!.tV(\_mx\XwSr'wbwQ 3 BE^\exp-?9D0&52-Qw'|P7BKy  $:o:;^uh}Mg[!]$ 6T\*z7UB:Go2^+HP rf P<1;KK&<%z~}fxS/(mYp#FR{\$as.;/ecAj]xxF-'88(:& O~. oqoOnO>#<,tFhFzO6ME)f]!,Ai@IO}F+3sw!(\J;J\$=0;X"e\_,Wwkp|T(\$q )a+a0B10Nc!20/a~0&0a\_010 aL`0`ca?Og4ys25a? >#xf\*f}0 w8Pdg1`rIy%@2Y#SoZ|t\*)(w0?^033; >0M7g+b^/#?ff,b\_7z>|coF}xYJa^{GPcF`be\_`.1>LLufa7azfka~gj}1\$&OSC;V0k&f|udNUV tRL701# 1/B -^4qpQ[6 @x N7I" #vL8I 1 &m00Y 0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3 7nXgxfF`/;Nk  $0L^{0}(b0xg<)$ a5yk = !\*[x?]/>yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa >[|w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad% LLG,;&bkK!rK\$)o\$\_BrKHB5aFVOF#'|<\$x\$qew -

 $a>vaYla0/a~&?~<x[\&;O_:v''EnLJ<hY>^g;11In|vGK2lf\}Km^I\incM6?djoK{O]uR>Y#BSofx>xvo|$wRR34Z{7%Gb Gl_]7{t YY>&}$ 

 $\label{eq:2} zHy7ePLqiS=!113Aeo~p\%:_$\% fNLdLrRb(/KR0)QK\%:*A;:L@BhNV;/$rIhpq;,Z..FGq0|j=*\%hj\%1tCLXpB3be$+ LtHsY1KBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\$KW6}+E".\%iEE JttOet=uP9r$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu*/A;J*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH_sRZSjV3L*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G_h;vJ.WIS$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/*/-qZ*$xGi{kU!=nNs.i} LO>%KX\vmoT0o3&w3v.JHp${%9N%t5X@x?9TS7L[7]BQ"48]Q>yt)E?Ux*R%:YIqz^[wyIA N$:9hC:IK%"<\=2h{Zx#$gD} )WS6&@Lx}_+Rjq rcP6pUxXDt$ 

 $\label{eq:sonward} $$\circ\rM/g^L#4py;gK7V|8qBN5$$ 

 $\label{eq:cmp-a-ikzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55]>8/c%Kh2s+Sd%}o-Gg#GW_.=n=S#}wMEEEK1&0K+v.]/xuNM~3]0k$ 

 $ERjU{+}8{+}Z{*}UJc\_isCd$ 

 $j(c\#){9YpH"bPv[u|h5r;}$ 

 $mr | A^zOzin/X \{ wg | sMtAfU. | \} d*m6OYFw^] qRX1 'DvNCs6n1 @ [8\&n2] 39O] = Chm&0) [I2ug? < 6]) T"""hb = Chman (Sharaka ) (Sharaka$ 

=z\$7jHEC6h kt\_~={}!]J}Yuq3iBtEi2e/e9R~}}Y5o.+WVC5lPGKhYAP3g0[

 $Kg2^{m}e0m | ma3 < 2l\&MTSO = ke.k > / |7jiyLS`A; \{O:v(7x5k\# < / >@^u-7j\$z - S2dxSLyjm:6^*? | for all the second second$ 

 $@4Cz!)_{;zbPqc1cdK}C,042@1v0F[v*:uR1D00?FM|FlsA$ 

icuZlask

CI1 ZW\^#3x |G94i\$0.qE9a%'\_|Q@0@P\.RT

D;vnT\_V\_V-1b@;}QYBiOOXB/>xB#c\r.?PQ0`5gF]mFg8

 $Bx6ia.nY_{qA0} \ wQQDopRbOo\#q+@$ 

`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T

 $1 \sim D4yqD.XgB6_e? \& wWpa> |; 6d \#N \sim IFn8 vqC5xmb@A0 \& = 4.DYVZhX*THJ1PDhQ(\#) fIQH | fIQH |$ 

 $0!BBi]kB@h/k0cSG_F_PW+c;kyK;1WW\$OFc;rrI4y^--~u`h1uF$ 

 $0/kx.l\#_5@{HG(c2^*?u!@x/0^;<?99189r!bM)Nq_1jDic`V2c<Vy[<TzTI$='!y$SL\!df29fy80Bca]70}$ 

][opcK^NyB

 $v^{*}F]vm|zM/[n$ 

 $+SX1cG0@;CZl)5J\!\!>\!\!i)RD_f\!<\!\!M6vZz,\!ukDDD]w\%$ 

aL`0`ca0/a~0L#xUVyKgruI"EK>nV2dII."Tk975kz0;d#Hppz2k,iws+reIk2bITT

)))\*=xw

 $0 K dy9 pzyFDz>,\_~,XU=q];]IS.]n\_>a,0;er-Rrei=ZsqTTI*3gn{I[7INN'|Rm+'OmqqqcG.9R>\backslash4i''=?~<RF $G=>n3r:}$ 

 $]3gSBBB_k~[~IZlnZz{s=ZF{aFvOq2qDcI}e1jN:uM6zj7]dIOaDgxb]mn`1KUl\aZjic=o\~Z>}k;,Y''k>=!5j(TRZW0\# [38r4K{{^zy<.e+(P.'|P3x)}}k'])$ 

]v

$$\label{eq:starset} \begin{split} & |\&: \#ZGNogy \sim \\ & i \#qyi>gg \} v9rxLeDt[zx<uv]^bqBn]1b.;"q]G \} VZuFzs ] waFv\%=JeO \} X L.? \\ & \% 6KLL Wq2`wK;g:G/z66l +W5\aQhtE{_}^ytsjy;wePfrB \\ _hhOW_?\adW\pm8wB=|L''OOE^G> \\ & h|GENkq?r~s-)+ FUTnIaCh`?# \\ & eG`/FtIjpGit;2r9so\& \\ & bm?qs>pq{fv}sf6oku(aFvB=O|Bx1<yRYf^x0~ozWf"s70P7<zBB;J2"zcygtoY,]TFq*zBy!'''''4aF1bgw/5gv.;Q9)Sg{ *^X'MNtc=58^g8_Z''??yd]v{"EN4t} \end{split}$$

Zc"#zK.6l}Eo]LUIYZHC%K0'Y\$cc<

.g8y7xlsD3<xP-)PnSa+g^gT\_jU

 $RPL < \sim C^9 \% x < wk | < nkHhYtiS. | HySad. AeKAZB+] \#2 \% 4x1F6I-^L?L, Zc? | X]d5S^w-Ward AckAZB+ = Marchaeler AccAZB+ = Marchaeler A$ 

\_;iM7\/NMIn\rt?~o>UqQrGG6KrJ.ye#6eI.ykH%V)<54&&d\$\yQu&G."i0#pG+/]sn4n@J\*)Z\*V(/2zOS9x\*x;^y)\H= &h>11ddsK\_-RXohhtpHagXd4hwf,>="qP"X;LdCA

 $cE4&yUdJ*a&0GQ5a*@;88Xn~v_pJ2e~+V={eZ2JbRo ^_j>/. Bxq(:Yn*|g{,=^8Ni;Q2nGmKUS&gm]`g_~5-} b_{1}M@) L = (5WD) = (5216-2) L = (1400) E_{2}(1400) E_{2}(1$ 

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$$\label{eq:solution} \begin{split} &5U]Hd|R@~Z\#''; \\ &6zEyQzF+^{$p/VTV,oBTx&5M}ZpIJNyr;y|)Q<X6iIOGD$8(@NHp`(+7\%HJC8QY-A;Ud6nO;eP^~'5s0:t4mR5Dt/+VPPAk*73BmI~ddYagK0K?aZK{nKY7|-~wXby\Y#Bps+Kf|5jwYt^{}LL<Y9|8]v./ccc>'N x0R`#Y~KLLzoO%?~XY?^7 \end{split}$$

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 $\label{eq:solution} $$ TM_{\rm e}:SWPbJ~sn\#Q5[>izn:]E](~e:Bznrf=(Mn?u~qlO>=6.\8{m{@nXmA5k&svG#c<zhI&rj>q`)g?F&M+R'a1} = {MC[j.c<wUK;o<PBonM:u?+BG:t([n;u(~PtiOs+1F70M@-ZTo)S$O<1r-_~?_G7n8}];1,-[V[!</R>$ 

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?oYnMxbFwi*"}U'yR-Zf[n-/,XP1KZcRc/>wu-812&-!!MP`6mj/3,S1voyBl2r #vW/mF"E4D6F]t}9sf;
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U``.@%ExtractLanguageEmbeddedUrlCreativeWork_substg1.0_8012101F-00000002<g_substg1.0_8012101F-
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# 1.49 internet-explorer 11.00.17763.5830

0000000B<pUrl1.0

## 1.49.1 Available under license :

```
License Path :

Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal
```

>sA

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authas:InferenceClassificationResultClientInfo2CurrentMessageSafetyFlagsEntityNames,HeaderBodyFragmentList HasQuotedText&IsQuotedTextChangedacceptlanguage6ConversationIndexTrackingExdx-ms-exchangeorganization-originalclientipaddressdx-ms-exchange-organization-originalserveripaddressJx-ms-exchangeorganization-authsource,LatestMessageWordCountIsSignedIsReadReceiptPx-ms-exchange-organization-

authmechanismBInferenceClassificationTrackingExTeeVersionTeeNextScenarioTeeNextPayload.EntityExtraction/ Url1.0JX-Microsoft-Antispam-Mailbox-DeliveryBX-Microsoft-Antispam-Message-

Info4InferenceMessageIdentifierNEntityExtraction/KeyPhraseExtraction2.0, x-ms-publictraffictypex-ms-hasattach, authentication-resultsNx-ms-office365-filtering-correlation-id4x-ms-traffictypediagnostic6x-forefrontantispam-report(x-microsoft-antispamXx-ms-exchange-crosstenant-network-message-idZx-ms-exchangecrosstenant-originalarrivaltimeTx-ms-exchange-crosstenant-fromentityheader8x-ms-exchange-crosstenant-idJx-msexchange-crosstenant-mailboxtypeVx-ms-exchange-crosstenant-userprincipalnamebx-ms-exchange-transportcrosstenantheadersstampedNx-ms-exchange-transport-endtoendlatencyNx-ms-exchange-processed-bybccfoldering@x-ms-exchange-crosstenant-authasHx-ms-exchange-crosstenant-

 $authsource>OriginalInferenceClassificationHGriffinInferenceClassificationResult:InferenceClassificationReason2Cl assificationDiagnostics2ConversationContributions,ConversationWasFocused4TriageHeuristicsFeatureSetBGriffin TriageHeuristicsFeatureSet:SharedWithMe/HasSharedContent,FocusedInboxModelScore.SharedWithMe/HasWebL inkDarwin/Url2.0@EntityExtraction/CreativeWork1.0xEntityExtraction/KeyPhraseExtractionPosTaggerTeeInferen ce2.08BigFunnelCompleteIndexingEnd<BigFunnelCompleteIndexingStart,BigFunnelCorrelationId$IsPartiallyIndex ed.LastIndexingAttemptTime.ExtractedFromTEENetCore_substg1.0_10030102*(_substg1.0_10040102*_substg1.0_10060102*)$ 

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3IPM.NoteLicense URLs and Parent component details for Windows 2019 LTSC

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(FYDIBOHF23S\_substg1.0\_0037001F\*,\_\_substg1.0\_003B0102\*#'/\_\_substg1.0\_003D001F\*\_\_substg1.0\_003F01 02\*&(2PDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-

MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange Administrative Group

```
(FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f14858\_substg1.0\_0040001F*5<\_substg1.0\_00410102*
```

%-6\_\_substg1.0\_0042001F\*9.\_\_substg1.0\_00430102\*\*,:93feee6a76ad1ba6-amakothaAman Kothari

(amakotha)@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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MMALAYAN Marimuthu\ Malayan di\ (mmalayan) EX: / O= EXCHANGE LABS / OU= EXCHANGE LAB
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ADMINISTRATIVE GROUP

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9I_substg1.0_00710102*L_substg1.0_0075001F*24M485893FEEE6A76AD1BA6-AMAKOTHALicense URLs
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MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP
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(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-
```

MMALAYAN<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.pReceived: from CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17)

by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

12:38:28 + 0000

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version: 1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

 $X-MS-Exchange-CrossTenant-AuthSource:\ SA2PR11MB4793.namprd11.prod.outlook.com$ 

X-MS-Exchange-CrossTenant-AuthAs: Internal

X-MS-Exchange-CrossTenant-Network-Message-Id: ae 58 cdcc-7894-4f0f-8074-08 dcc 114 fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:I;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

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Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f1485893feee6a76ad1ba6amakothaAman Kothari (amakotha)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

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(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHALX LX

Salil G K

(sagk)\_substg1.0\_0E02001F\*\_substg1.0\_0E03001F\*1Qg"\_substg1.0\_0E04001F\*h>\_substg1.0\_0E05001F\*B Di

Marimuthu Malayandi (mmalayan)InboxLicense URLs and Parent component details for Windows 2019 LTSC image)EUzgbOSIq:(Zi%:(Zi%\_substg1.0\_0E1D001F\*j\_substg1.0\_0E4C0102\*CGm\_substg1.0\_0E4D0102\*n\_ substg1.0\_0E4E0102\*FHo\_substg1.0\_0E580102\*p\_substg1.0\_0E590102\*EMq\_substg1.0\_0F030102\*r\_subst g1.0 1000001F\*JLs:(Zi%:(ZiAG~M{nHHi

Marimuthu.

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

bLZFu\* rcpg1252Chtml11bid0 'ch set0 PVUUQW2U3FYkcu ;B7 134R`cP dL364 \*\9 < x:o="Ipn:hesL-m `so-]m e!"w /!?# d"m#@tp://U#.\$'.!/!/04/ (m"&Gw\*`.w3.g/TR/REC-40">cAead+k -}6\_\_substg1.0\_10090102\*\_\_substg1.0\_1035001F\*KO\_\_substg1.0\_120B0102\* \_\_substg1.0\_300B0102\*NP<< lna#@G at"0 t#@M\$6 W% 15 (" qPum)+ /s0tyle4//!-B-/\* F! Diti \*/ @-fne 0{95\$ ly:"C0Pb!0h"9 n\$`pe-1:p023=06==a`}8{9:A0\$`</=310pCV>7qSG5r7 p.M!PNI, liFZ}PvFX?\*:0cmA?#z"0yB.00J.:A3",sqKrAm!P-Gg0p#nd1SxO1N|?pP#!`ngPg"0EN-US>a:GnkFs<FRHypTHO!y5c-p8@; 99A:#467886AP-08a:uP Ue>TcED17UV5pU:U!P0@!!p=KLMX%P  $owP\!\!>\!\!FRChpEau\backslash]P\_@-;J/K?QR\!\!>$ 

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```

(

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8w^/A U aG.u8avWebPFPjQDE12#P;{C 1 L"FThi2P
```

 $w@0008P" P II1 c3 !LTSC pj\/zr \[/_08,0 hPf&D&b.cPck'r/$'*Pa""etldrfw0{@HYPERL{K `ecAdP?wra+&nbT`X'a@/?3}$ 

w@!Pp" 'Mo'M??/?Oog\*b'\5 -P/w`Opl/;!Vr-O\_nO\_o@?/?O\_oI@'81RPIw0ry T\_oT?

?//?O\_!

,-#?O1OO&'5)\*,0.//?@aS0@Ocx`ppZ`jj1PX!\_1P./?OI?JOK\_15689:/;?<O=\_>o?@W?BC[`r^Qn"-

 $OPQ/R?SOT\_UoV\XYZ[\]nOoSSBOM:$ 

 $b@xy{\sim}/?O?/?OVPqeH@kwg`4py$ 

Fr?GAaF F

```
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```

js

+QWY 13579;=GIKSU]'?"B@Q?\*%)-ACE2[:B/Marimuthu Malayandi

(mmalayan)\_\_substg1.0\_30140102\*\_\_substg1.0\_36770102\*IYJ\_\_substg1.0\_3FFA001F\*<\_\_substg1.0\_3FFB0102\* RT@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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AMAKOTHA\_substg1.0\_4022001F\*\_substg1.0\_4023001F\*SW\_substg1.0\_4024001F\*\_substg1.0\_4025001F\* VXEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANAman Kothari (amakotha)Aman Kothari

MMALAYANAman

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*._substg1.0_4039001F*[<<_substg1.0_5D01001F*$_substg1.0_5D02001F*^`$_substg1.0_5D07001F*$_substg1.0_5D08001F*A$_substg1.0_5D0A001F*$_substg1.0_5D0B001F*bd$mmalayan@cisco.comamakotha@cisco.commmalayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt_substg1.0_5D160102*_substg1.0_5FE5001F*cg,_substg1.0_65E20102*_substg1.0_65E30102*fh_substg1.0_80080048*_substg1.0_800A001F*emX_substg1.0_800C001F*h_substg1.0_800D001F*jIY(!eyJJc1VybEJlaW5nU2Nhbm51ZCI6IIIsIIVybFd yaXRIVGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hFZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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!"#\$%&'()\*+,-

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PM;ODF=Inbox;IFIC=<null>;HDTR=0;HDTF=V15420240627.08\_substg1.0\_8021001F\*\_substg1.0\_8022001F\* u}\_substg1.0\_8023001F\*t@\_substg1.0\_8024001F\*z|[

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https://hub.docker.com/r/microsoft/windows-servercore https://hub.docker.com/r/microsoft/windows-servercore",

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https://3rdpartysource.microsoft.com https://

"url/suffixText": "https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal

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?]333?^_`ab?c>de?fg?FocusedInboxFeatureSet_50104B?? ?
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Q?

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f{9::-"vg,*lSwZIM[3e*=2Wt:,&8fy{kz8(pf/^?snRpt
lEvdGw=E]ZN:GhLJ]x6%hEn379loY]^E*$O gZ5/mA$Xk%dn]]*eY^Ju7[RJ oy3]wH$@%`r;WD
p~eLJ$<.tr7bga1cb}f"?3D]-A1BN&S8!mQ:?6mj(,]SX +C8Uy5nX0Woz*
8uvGAtr!$N^r'n6_bSM pVg}|uy0}$'
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Gu%u(+bZ 8%):"q|%T/13g"S

,An?+G?c

 $\label{eq:urstar} URx < o; wn 9XPNi] jw K: D\ 4s: U: w5-7] wXH1y RhcKk \{ (WJ.9j\&\ y: bd\ \%Jh6fC \sim goHq'f \# | n \ NH1y RhcKk \} \}$ 

v8v +b5jlO>z /

!b[Oa\$q

```
cimc=T8PZ{U+
```

```
0%uKG-*#F'w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg
mf ' }|wY ,v|<ap3B@ASZ?!
! ~?
#8VBX@[B`O?<
33u'|_yQ#86"_ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
chqyIHHH6
EIHrG*C#?>;bB ~p2fK#/j0JFrN`kc^06lu">&M6c[nP}.H,|lUV!8a0:99nu]g9u,U7$7[N+B
+r2@Bf.wSP~*QpGpp\Y\Fp3o^a+uU,>#+yv4V\1|\P\ 0\8.dYW\K2sf"H (d{/EuS^w})
P"7k+e$j(%SRG;]]#++?;6h`8eR$-4E*mT0a$ oHp"a/a7n~#1Nw8,Z(w]>F[$II|onJS4~GN
cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$@$p(S"
  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
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                                    ?(:$@$@$@$@$@$@$@$@$@$P P('
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                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
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                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
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                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
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                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P('
                                    ?(:$@$@$@$@$@$@$@$@$@$PP('
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  ?(:$@$@$@$@$@$@$@$@$@$PP('
?(:$@$@$@$@$@$@$@$@$@$P P(';w D:tbICn
   M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH$@$@$@$@$@$@$@UXH{[NrI9CjQq$@$@$@$@$@$@$P8 P(&c+W#Fq/l>oF-[f0
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^ mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/{z+VVO>4lN>d0`3>
@W7xCpp<\=4kQ:ukg|RuSSSs~Z K/MGRF
>6mZa ?IKKw3QFe
                 @11*=md{/Eu@ip>LId}Ye,\IA[C>$Iz\Q${NA(o;pNn)}
9j*)VX:>-(*
0bC
mqF]l?2i$;w.>SO=%wqGP9
&w)9%4AmKN?t3gN>.7xcSN(vD/~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+_`8
"%\bgbY%ew{,'{
6>8
       "P HHL|{W_}t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
usx-.#
g:tampVC tx/#
fIY3fnu
4vXkE^{};Pxqn+NW^{1}-H.92+nkA
!L=Z h([t5>a7 `@_,X UFXmip
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiY]F8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
```

HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K\_|0IHHHHHH,h\* GVeRm\$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK\_A#1g`Xl#uGwax'rJxkWNom8}\$@\$@\$@\$@\$@\$@\$p>pi+5 T[.?x# r O~" @!3JN2U%r {AeS3d [lq j%\*\$/un^[|r-x:)0#g@B,z3zjor091; y|0D0(C=\$2x%p`<`T1M; rB6g11# bXz={CrO\$@\$@\$@\$@\$@\$@;g H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(\_[n':Q5IA0\*\_fS0nV#NCY\_+WsNK]Haa9 8 p~ 1BH fxC:F8(6b\_lLizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku\_aqeJfcpA8?\$uM[NsZZPFNe!f&X 83 GcX&{`(\$@\$@\$@\$@\$@\$@\$@ #Jg1q W%\\$ @;J?f#W7aW"QF^BP9@R^sa &\*`yg\$0@[o0C-?)k\_ g\_hmf8mBL|E(F [0[00v V~!zCNc06 HQ)\$@\$@\$@\$@\$@\$@\$@'Ag3IF24a6N YSP1e?K(IM"o)0YFw Iux^'XaM4I0b&\*6e^2fGz6Ei=5=aLD^F0[\$ aj^!F|LX6I|a1!\*<yqtE9g,\$@\$@\$@\$@\$@\$@\$@\$@A F,A\$pu/ N(Z > b)[Kie]pB8::ZL|??6l mu'1,hB4i>xkyuky/Em{O>qk}unAofb8BM`2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq \%8w@A E5P veyk3gbC}-P>kD/oO? o<LG<G!}7n[;#>@71"  $x?(-3\&B8YF wsX9-(olkfU[ZEt'8"dh0 L F={o}))$ GKMkf<c360|;1 ,kN{=]\$6^^uNh1bf\$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC I/b#?F wU0b}5E|rCa`FA}R|fFmV?G87|WP%Bh4PZ\$p`dgB8%/Xg"O?TI}Fbf\$xA1a@"n;/G{.>^p~E~WO\$EhzJ?HCNII6= dnrHHHHHHB JLr~EV`/W\_s='&y.\$/7,[%,<r<3^5aDJ\*>=+JW\_}Utn7U0+PC-S7!T0]]?yRS%-~0G(P Wp>QXZJ }q0:!)`5>mm&Sq!00b]HfPHHHHHHH|P5.RIrf2N-z{Ix w;=3Ycd\$rY6B\*IhQZQj/@<x(0sN9pG%Q>:wFFitE~o[6<x7#:!%!{xpi}a(@H+Dl`6I]"R `+rHH\$jQ w|Axke!<O[\*@%|41P)IA| TH4T" s?aHHHHHHHQcPJp8)BPY]"\$ {@ \$aUjDdf`ORHT #0SY4m)fX? JXDI\$@\$@\$@\$@\$@\$@\$@\$P1 A @)jL %)I9zU0TDb\$ {\`!aun\*^}J}\$<Th(\$@\$@\$@\$@\$@\$@\$@\$@KTB #gJ\*Oc@Pd!1@@v,>uJA%-0J `ZHHHHHHHHHHHL8IW( J2dgHLW3'0Ac@@:vd.)X;+SN0 @IA^ (Gh(G7]! "@@Ie\$@\$@\$@\$@\$@\$@\$@\$@\$@\$PPnB\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@%E\*}V\$+}`R~quYZ: {"A>m`\$@\$@\$@\$@\$@\$@\$@\$@\$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII \*I@ `oPC}zMOV%P "M6I (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4 7@q({OCYrPRN P\t 3GpNb9!0Ac@v2g8a\*}!&g+\*^SAY0 @Y`IHHHHHHHHH PJ %>& R"@@)f3\$@\$@\$@\$@\$@\$e\$t\*@IDAT\$@\$@\$@\$Ph(KIHHHHHHHHHHH (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eIIHHHHHHHHHHH @YA.m %>& R"@@)f3\$@\$@\$@\$@\$@\$@\$@\$@\$@\$Ph(KIHHHHHHHHHHH @YA.m (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eI,g\$@\$@\$PK]2%"4PMHHHHHH Dba (j%z"&3S{+eGOC7~=e`#%~\*[

```
tI:uJU N
-LR/
w7Q
      @&@@?F!?SJ;+M}'ZS$wL.Y7]'OI ;CF.?fhUk{+%&Kzk(A2%HF- XUke_ri##I4S~]/Z<% "<gy,0}\Yr8yR
ThYoM*
          @YA'(29t[N{;?P)J[65-[)}2<x_~Zk_$dKRbS
NW*Kt'Ks0w3xI:%++;_`gITYnfM)zs
:"}9y2{whLf,ZV O@o7x%5A! D
Vk!@*Udn
PZ;vL6o,|[>#=[r+VwY]g_]|(ZtlJc/P[-ChR?XFXPb0>{+1
pIt_s !NVTZj?s.3= O#^qNWS~T#
eq\& @ADr \$, \] qlN:-[1c;\%:\#w(=[6GD[x'pZq>qIxa7HAxWcdU\%*R@wB\$@\$@\$@\$@\$@\$@\&\&\&c!I( <uCiii0Pk)]
{ymJN6MCaoC!Ct;k/gb6*2'B)6lR)+jdtV({Az(c\-fz>j=TuBNU0Eamq\?[fI^iK {b}
(vkvyo!}^8qhROC2n8aJ?Oy,]&vVP2@_SdTT<jvl.NVWE.0W<Ki8H$}$k"^K*+CUVnKOgU[2=hV/Dz 7TkReOo-
U~ |ie^^~;%SJ'RN"#&uV~^"|J2-3NPMw:*'%bHy$t)okG+YsUrkdr Mur|"[d2;/:^/M;du{!9|$A*U
hy};+dX,P?:H7z-jzB?W(s/+WukWV?F*hs@KqZUuN.^ia{OY%9?fS_y569f#@?v
v(u.YllO$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<*tRSrMg!>>rAVr'JyYYd1IW
Vu{IF3~Ucx}z^MY>@>gc7>6Z-R}LoP!/Hc[v{]&
  (^4/OF$P\RR.]>+ygedYzo6^BxRhuRJ$~F'EP-*HzC2"SiiI2WQdRJJUINa1
{8^g*Hv\"O=6)>sT2Z1|j\XjS'db2*Gj1)soTy(Yk4e>
]m#*U*>Z(N<~BQ::7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS
```

```
Jip;x\[]\a~Q,2U\%vra7G!2<\!\!\sim\!\!qj^vv\{([\Q_ks\\&uxhlC>W>XKF
```

```
\label{eq:2QrrlSV,wHPpeA} @B?^,_Q9K) + ]VA@pNxR^~c}q(w?Ir+_r/~"*'N\&)U]p~Uca9Q\}| < \{29[ezcpBavYKz k6I+7HHHHHt8UJaB @\Gamma; \&: \end{tabular} \label{eq:2QrrlSV} \end{tabular} \label{eq:2QrrlSV} \end{tabular} \end{tabu
```

```
u7EIFd2ydGHa89,$@v
```

```
90 I&<W_y2<H:PbL3wy3<xC^D+U
```

```
\label{eq:kPRne[q.c@!rMJrX)Q&rkGk(/mN6\]m''K6iEk/}y\v5B=^6Q>2.rR P:U LQv*2\#uyX<)cv)n2`Dq5[d5aTdu4k8PM|zt OSf;<C+H7o-S\%womh\[yVJe`Xn12ro2kB''5cVa]\},YF)<,vntU+'
```

```
\label{eq:listic} \ensuremath{\sc v} \ensuremath{
```

\_PQ^v

```
9<\!\!>@aV<\!0M;mh\&|Iy@A^2/YN-J\{\9^@_dVYU60\%-5:eO)!Q
```

```
\label{eq:constraint} xw=ZOHHiBV; 6n6ydui&iGNoKq2O\?\sim 2KL < C.(SSjeI_;f]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}7sS=HuO{U]#of.:#Os_|BvxKIr AxKPWF}]
```

```
>)`$.*PQ2:DWHzNJ0{R_FiD.urRFvHduS5|E/
```

```
`6e.O^=:qk
```

```
<PFV@
```

```
:f8wfe]2zfP6??0b
```

P[

```
O3@W\N>*t(&(*=wT<`s]C!w
```

```
a:rZyV3 < B3 = pPe(mBySn`*\$YRB7?N|:U?Z^{c}=05*r^{SS}{7B77-pi+T+0Rzv@`:v\#}\&'< Q-Ey:4k
```

djNE<zJ0`F

[Uiy

<\_&

a8OuXV`nz]0.,||3CD

```
>*J$@$@$@$P\%' p=zSjc_,$F0K*;v:tPTXv+I.J $&0g(oJz@Ss2T~ItlJ2Z<2^-{EJ+PWUBZ1nc]#fkXblm1PGU YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]Q GdHE}PZ#Od`uG((!69u<ho7Q8(wi^/_U(m'{Wu-Ve}V)9rb!v+`A{o!k*OPDG|>z}S Ka$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 $8p+I7o))
```

```
x<h df <xl(]AjdWra oI&<Oe73ty#Oh61oR3-
GHWx0?.E9tk6{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m&$x*b0;x{Ktg#k==$8G)3i1u(e)B9Iznxi':.$FtlcV,r~
y? ^v 9mt(b&/ga5tP{'i{w)O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj*rq=;:PKzOf
m<ru9)GxB$@$@$@$P^nlH@(^Z
&~-[T|nvYtiA&W\!y9=*/=BtR'6cUum5TXc\%fwy(_7WJGaWVeLye @3.v#_[Y=r12zU-F7mUV_bctRD*
G]1Mx#ERnT,YV.tJ~XKjj+Qy'ty(dTnr;zY'N&f7}wc \0
[])(f;:f2UU7r?XR1_VCn'Td*xOxB1~%0OGcDRd< 8$16-O8gx~I]NaHLC!
(76B$@%O}gIT$y_h{1y9z\QrX[#I&<Py\*maeRCbTd=^1|ILIi0wzA2xyC%uYT1,I]o=S>G]LrC_swX6]^Sp]'O${v
R=Uo@?Bv^qQ+eam'WWRrsH]RMyD8G'<Bv:%
P527GsdP>>K wg?T.f\8!"V5/oUr>oF%a6#-0QY! !@@pf+$@jE(>>^>} d>9q
D&07]
iQy$X>co
S x^2 x X f < [5yri2 Y > MdyaduB Wb8BU2y
6}(/KhfSRb,?Nz/'v)#r!f?bF&ic8tl2uz}A$OX9&wIjg(0@6nYP"c@joFVLJ.%wqr*jA#[d5Vm{+7/&O4SI{
~O'$5(SS,Vrs~Y3 #@@fK$@@tt6$'{z(!lk7C_"eA\;2d2!_3CX-k>/qA`s{g*sscZ} +#o&/g!L(3JMW=19y5
b4ytW0rkB`ZN<)P?$[>tnQ*-S]';R#BB/1U
f
dYHN s;De-DFFHrrXg/Si ]x.U((#fB 1hVc&?K3o6SSF
BV Px0eh/e{wy5B$@$@$@$@$Pz)=lH [u/Zv%4win dYHQUrKRdnNt_.=n-SE~<16Q{u\M;3Mf.s
*HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+".
:mP!b[zDLUgerJ$ddV ? s.Q5u@eG s@>Z&<-<qjo
Yvni> '@@#f$@O>B3 t[r.o^{MRRRT\r58/FXZi5cV'%gWs\><E~]*B^#W+G;flwPA#"W&Ip,2 r\{+)/
~A9pLyqj>\/.S/y3q5*_A=BuZy-
BlR!OdEnfNm <: 5kBcfcf5O+ji?4J9 < ~Bv'u\&R]o?wS,[[UcV*oW/Eq0] < RFec/d$U(-
$k0D%$9JA;k6ly%u]\KWvy2Y`*w<O9+;;{& (a40`VO$Pzue)rUWo;sg5j!l$-
nSC + = "fJ(Q(@).hXIR39I>Nn)#c0_H < SOKr?[pCQQN^{{{GkI.}_{/f}*T}Dx^{(2_ts]c2kKjvP@BUc1{?L&}#GS{g}})}
'5 Mid8M~Zu/s
P|)W,g{ch/dJ
7s`.w^I4]CT I]{yK)>_z3e0',[AA,/UkISgt\eTnXK _#v@y
c|)U[]]"]7ca]^Ei]f9cRop_g1`Kho{Ms'%)#{#$[#!O}Nq}Y8q[5o16one<6PyC>{mR 0~!V)$@$@$@$@H
WQ) ( IIIysUwQKSl=K/k[ozX\RYS
C@B!o|$o+zm?Q9C.&SQ_>i@U.(S~Y*I k,9BTw$+c{2'pxGWc0V3^?Zw\'iO` #o{-Y38*
t%X@8iV oyQ1T1?j
*_MY*W3}m5F.epko?V<(|_MG <g^?a_('xD%gSeN_|/)j @ U%iSXVMd:_{}+mxxQmCem R%q1n@
\label{eq:cv} $$ $$ wW}FRJXBi5ko}Y)?4M3|Ux0@0Ka}*\qPXH.W&ZN)NQ(cVht3`A]>kD!*AqLz'(1(u1*F=-1))AqLz'(1(u1*T))AqLz'(1(u1*T
8lSo~mwx+NEs8)Bgco8~2n7W:|t4egz8ecM$@$@$@$@$P
Ζ
b$@$P\M62p@8q,[L4iz(On]&>>^.rrw
([P/BJy8k9g>aJ]X/g&jlTa`[Dd%rR"/pb3oa&_.0L6c+?q[5I\(,>J^*n9Co^<7G)HK+cFINm1n*c;EE)/l-jF
A(|\sim vu*cP^9T\%X < dW B4JtkY(L|n{iwR}xky;zi7Jz 8h@=B.
+=
h:J+^$>yc
fqo^n:@Toc V5"iw}Pwp{ymlm<a0S*3bFU.pwB{vmuy]F~V1[<;Lui;/h>P=!x0VhM
  R
```

```
J#_PO+C<DK d,jE]U"SHAgK5`
```

 $7\_uq8b^2\_)hRBp@\_5Pr8yR++GBfs.PBrT]gjvDB!4U37?c\#820j`?z2${T5DWSIV5eH8cU!asaD1xe2-interval and interval and i$ 

```
X.=fxFNT1]6! (***AO$P9rDNkJ}cvI]
uhR>U))^AiPR
aPWn^n@_#.PU@qY/Sa3^
G''
#.)\GI~VSmOiHIZ)O7Jn;w5)3O,C$@$@$@$P04K -[={;RdtX>l,0vH\87GCK`HC hK Tp,W3WO(TV\'80:-
?JN[Z
zj-r\&
)$HHHH** #d-
&v{+$@$@$P
ru3a)k> 32
M$@$@$@$Ph(]lHh:tH4h wu<?ujKU}(WIId!SN\F4oPjz~U @!@@>}z*$pGGB$P1 ZO"^
   !hV$
hWF$@$@$@$@$@$@$@$@n4QpHHHHHHHHH*.*
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
  F
n\!
hWF$@$@$@$@$@$@$@$@$@n4QpHHHHHHHHHH*.*
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
  F
n\!
hWF$@$@$@$@$@$@$@$@n4QpHHHHHHHHHH*.*
  F
      K{oye$@$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^
n\!
hWF$@$@$@$@$@$@$@$@$@$@$@h4QpHHHHHHHHHHHH+.{i2 o9"[1*UHfrEO:%6m].66w TN8W+!
g?WJ$@% @hecGQ\|r[o:$CHS
QrY}P\UyI}ofi$sxy')~^ILL}^e=%)Gg0**SrIIIv\oY\ol
]5@%0m4Yf?#|[J^dCBB$..Nbbb<0^*'Ov|_0.Qu?2]b][gyg_?_+-FJi3g\~RzuLzIZ_|Q0Rtx_? ^
,:o)Eo5sfxvq\kaEp x#Ap? @'*.t?}x1cd `{O ;CJV<?_]+h?C>wVSUZUM['f^x~(2L$B-`lb&8
vcq`riC~JIqxW0kXk|w=zykZ7ow7f !d1m>H~m,4H/_gA`:+'`P-5W0!_|EWL$@$@A_R,G$P
M>}e6anq<DxC*2pBDg6uy7
> \Gamma xwur K
O?y1cA`
rI]^OIr7"%_]n3@_H-/\q{w{<ep2QFi?i:
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 $\label{eq:solution} $$ <38\vem9\#>\Rn?.w)N=S?i2W&u72)i-\s2as^ziICP\{O>LG?QOY.? @ @VX9rM7MjllVSV6@IDAThd\}u]'I $$ C&8=::rr'ub-^<gr/OOG?v}L0"cc=!w\4KS!%7iV_6I_$ 

/rB @ @%04wG\*mSIZ2Jwqv}f,tgoIN;O<N/\*wC3w5<|mJ

n?HGyd:)ZS''H>>:)M @ @C`,t/3fMxIUSK'zRd{-I\_,s1Mhw'<)umNQ;zw\_<|mu3AHI}c+V4i|\_O72wA\_2oC-

}WXc,Vy @ @ @'0=oJ)pMDr-)]#s>)w!/?\$/\$EOfRc~{v

 $= J0 \# \text{-.} H @ @_`,9 CRLsWLI \& LnNAgN?s'8o`: \} \& w gnZj''Og = n2qaX3q-dDc \& fNWu/ \text{-}d2PKX |;$ 

&7 @ @VX6|)w^\$PL3HLITK6Y88A;s<1ytULY-1YNZ>uU6(\_{+yoNISP @ @

 $@`VCGvk6[mq{4}'n[d]Fdc+=OZG=Q+-LeL33-Mj6ze.hru<O-x;I'tg7C=!@@$ 

@y<675gro{Y{[wkYs5s3AiGzD~U?-\_hnc^W\_]LN \zLfrGE-Oz?!G @ @X

KF7?r1L.#1e]?>w|?`%9w'0p

74Hfs'-P8mIPfM7mvK.Byf!@ @ @^r;iUzU3> k.tMoy<OiL.O{&X(\_){~)g"#ke6 }or\_tB~e,5]Pgu[G @  $\mathbb{C}$ 

 $@\_oCcy^{(z=yrI'Mj/-*'_>I?2vmWnr/&yew/x`>tdZcR"Q\% ?VW~7~:IStQG8d^2c0Ae~xM @ @O`Y/W_o:SVaV-[6_Nn=+{Q2dd7<h+_Jr{?m^?CIQ[}~r'-)z8#0k_r7Z`C)c}$ 

JupN1K+mHzu @ @OCdgQL<d\$aev\o}r 'PHO6s)}C|]rw'L8AIQ%// ZdaF Jk=uYI\$0 @

@R`W(9|fmJF/T\`8){NPmq2B{.wK=iu @ @X'V @ @ @AGE @ @ @`,k @ @ @HD6 @ @ @\_@@`\_Cg@ @ @F

\$ @ @X: @ @ 0R@@`\$

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XA

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T @ @ @`, @ @ @@ @ @ @ X @ @ @\* P%< @ @ @%, /S#@ @ @U@@Jx\$@ @ @KX@@`\_\F @ @@H @ @N @ @T\* @ @,a%|q @ @U# @ @XK:5 @ @ PG @ @ uj @ @ @

 $T @ @ @`, @ @ @ @ @ @ & X @ @ @* P%< @ @ @%, /S#@ @ @U@@Jx$@ @ &KX@@`_\F @ @ & H @ @N @ & T* @ @,a% |q @ & U# @ & XK:5-?,[lq< @ & 0<% @ & & KU`R=U=v\{Zr!e]vv+ XY`*?V^Kfr. @ & @ -?OW_W\qE7-Ls)~j9DR$ 

@ @,F)Uf @ @ 0KwwqCZrg: @ @ @`3< w+w~UW

]n! @ @N@@`v^e5(prjA'N[ouo?t^!@ @ fy^{rl'r/G19//C9^,\$@ @ L\*s!@ @ @--0 @ @ @\$

 $Z.r7/Y\wum'(HO*5)\oq IW_uo~Sl~\&.*,T_.:J[@ @$ 

 $z!zg|t"p^{-}+?od+o0_{bEjJ}&X]Z4mjrO3a[yYc/|a*mY]9?r-$ 

 $orGO\&, O'1SI\; rRC = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\ 16uO|cmY^{*}\{.\}w/O = g54;3|-yW6| = :|F| \\ F = yOXe6^{*}K \\$ 

~\_m7RZk??g=Yoo'W\{C=t}s9\_;6M9NwY

@ @IYJ3Vnu[MW[wuT{#'NX-ei^gz

 $\label{eq:2.1} T_23=fO&Y9{A7^e<nml'7Z{bvjizrywicls='.:f<4~C2qiM\qm|K^2&tv:WX'zf&zs>g|?l/{&zA^@j]G3jOn-M! @ `kIlLZuAzPe;6~Ps:wgk9S>UJ%;\oZfx[}%<<mFm7<?{O\=}4~~K* =<Ole*/l;77wG<]9yo|3iFDIr[~ @ @s#|v&\T<;c=*~t9g}F_Um-jy \\$ 

%xzl? &\$LJ:\_g}o)Cy#YV5T;OgDK|[s;"A1Z>7tU+xT @

 $@N@@`g|^:a85p?h;?=$\#G{Q;Q\QF(FmHV\backslash Iwef^QI[*?Cr=Web}) \\$ 

 $1K2t9w \ @ \ @, IyVGy + \ Qz[I. < (0'|r \ 0m\_ElP^{^}fL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ @, IyVGy + \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ ~43Ox6:=/6?r-1K2t9w \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ\&o, \&\_IXJeX \ @ \ (0'|r \ 0m\_ElP^{^}eL(t'hMK?Cvd6NKFXuQ \ 0m\_ELP^{^}eL(t'hMK?Cvd6NKFX$ 

 $sJ\&1N(o|\_\sim=awh|N\_|;\_\&55zSuda\&*N||Vdyo\sim[w"#c\%UYN|eO\simCkwK\&BIdh @ @|yJ>{Wt8 l:}$ 

 $l\&=lD\#o?['mn3_b~Y"L:W:^=~u\#h\7q\'yuOoG>2|1L~N)?5\&^WMda_D\&?n^`nL^j"a8/~$ 

 $T8 \ C5wgL9FO > C(/~f^nk\&G1mR.h''/j=^@dG \ @$ 

 $@NHZm|i(\%Ma3R7\#[O]p[$=Chc?iOm>0s_2XL^TM^{+}(Y7ncAJFz[qZ5\#/xA3uYaV>ai{y6^lfCYk;@gt3ix[?[o]oa%s]nVYF} \label{eq:action} \label{eq:action}$ 

@ ,1q+s-%JK\_Zi8lb/Yd\$G=jpJwa[.`u~K.\$M:3bo]z#Gv}+m{=+u7]0d7/ 8<)Ocd3OwJiHZr'\_z&7=I1|\_\_<o~mf+% J=>X}wn5 @ @uaE>cmo{U+-[s5{Y^.#3pF}XwK\$L|

 $mwMoZ \#e^{[N?jE/j]7xy/|W^y^*\sim V} \{E7Z'N>l$ 

]

 $V <= mu < \5 @ @ < eZiZO:zpvXEu6~6gXiRv-5+e]lmm?$ 

 $R\{/'gg <\!\!=\!\!F\!\!>\!\!3Z;\!nwk =\!\!Dqz + @ @VY`PUNsM\$[.'/lt2gNK/t7aLw4VM <\!\!le{\sim}ihzpWM =\!\!Y\&k + k'u[n9uRSZ = @ MVY`PUNsM\$[.'/lt2gNK/t7aLw4VM <\!le{\sim}ihzpWM =\!\!Y\&k + k'u[n9uRSZ = @ MVY`PUNsM\$[.'/lt2gNK + k'u[n9uRSZ = @ MVY`PUNsM + k'u[n9uRSZ + (MVY`PUNsM + k'u[n9uRSZ + (MVY`PUN$ 

 $@*n?Xm\%)D+-m\%3-I\ fr2oi2wlqkt|$v;K0gK:g\%?,MN>3]t](Z\{ramC\%w6dr\%pG?$niMQ @ @f$ 

 $\label{eq:constraint} tw]:dsi8W \ 1_|g9V9W^R:::.\{+m8g/2xqfN3\}\ xdJbJ < 1M^N @ @V]@@`w^7((ML \ O \sim d=P[h)M) \ A = M(M) \$ 

oxCy; os#,lAs<dM?C9/yy> @ @,`yim}3&E`L5nunn+9zU.'A;d~x'=<o); @ @Ysv[

gYs2lZM&kj3j<yw&zV{`

7lml&UVH}c+M6|`Y%kG?Z<rFmQKVv6xJ:O;|SCp !yH9S[1 @ @

t\*UM7;ynvR[oc)\_W),orOY3; LxdfV[cLTs=oZ^u]oo}>3N:/iGqDy~fmPdN2iB @ 0;^k5

?%w|3);v+0{ ii=f4

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t9T%6\_IZ?^sWM<qDi

/ @ @:0@sw{Zt4Z.h/zY60Bi::x/46.#8Xx0h5wnu.\bE3^]Fm-( @

 $mx^VnY7'Eewn6|^Q!?tfy=>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0/|/<o$ 

 $6O.e < r' \sim Zw <) {)7y5epq}gN Gy^T \sim +NwZ1 > sLwh + muh < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + mwZ1 > sLwh + muh] < n \sim mz9v[i|m[jLyX = NwZ1 > sLwh + muh] < n \sim$ 

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 $vYE:|\SUCxFySZ2`zky;YvmHtT/3wu&Ib:o6myTZ+u9&6)9udCh_|X9_3|&'w'okL7)@\%\2\%IQR=rm2yt:k^)u8; wN;mr\-\%[mxp+g]^W63nt[2:U|nIvr-g[tnMys'< S>\% @$ 

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@^gJN[l\46,nm:FNzRbwko]2qnFOw9:>:>]Y|yIt(&_yrn>mn55H{hsFOg6`M6i.hF$*8N$BSz= Q E: @&"E
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3nG@@@@@8V?p;c

{Pc[5Kv[yiv3TRks%mT(B\*hBw(ZTR!vRkykn5y4VZN

fZhG]vY>QP`@zZ-

"4Q0`Ev

`{i<)P,;g-FI}e: Zr.RSjK.k\_=OU\_+r)\_(wPW?I/E{I3B6|\*miRI

BR:hNRltn;fgT~9"\*+10:O+(&8H 6Y{Q\_=Pw9PR0TR/(A~^t^n|HW\1ZNA)

a\b:m[l=saZVmm

c,'iYJEIc8?

K-TrHRTn

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-]&[oSO=#yCW^ c>3585R>*MZGA>wP, |Ks/laBw0_ME
.w!.>4h^]`pvJYg[iL%me{PXc.T]*i\h@S](ja<Rt;y9MJ*QR
Pz
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*K}k`SD_wuk1ITtH^-0y LwE [n)D2lVmYE5)sujM}k\{LOsZdk@@@@hk"5)yg{R 12cW
:uj]wfm@@@@jC@m'r$O7u3|dZ9O
zEx$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P*N'Y7Zf{w5XXb
{oIr/lxD@@@:I@c
hZ\pA\{B
6@@@@]B@]tn931e!v}h (@@yFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9;G
u-z'O.: z@IDAT c$ !@o\p2X@@@@@m7r @E*ba@@@@@jS@m7r @E*ba@@@@@jS@m7r
@E*ba@@@@iS@m7r @E*ba@@@@@iS@m7r
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3WTF@@@@eCee@Vw]pe4K@A$]?t]"! @45S&&V)6[@Q
*]g$@@@@hVF@+^V%IR +# Itknk--x A@g8mpVm
wxuB@@@@TM@L2FQB@@@R@[j/hve<v}ogY=8v@@@@9
P'|j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p)
+XzZ6XsHqbu'loMkpMR?N}*va{g
?r?S^x4`mlm;3OrG;tm{}[o=klWc9&w]&" waj+mq|8{L,/&|]rO7:d
a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:l7'Mb7D/o=Tgm_nMc x9~;,h
U3Jn]w7N<Dqme-
f" i%|e0SL{cL_v% B-XSO?Wsy^=Ozal-6cL{k!msfwa; }z^z=[av>=dwf/|GvAJY3%\wUW]f#<br/>b
kG \sim slZq9 \sim ?), 6 l{U > = *KH^{S}}
i?~A5@YnP61!k?t; C![[dw8^5W6zSgnZ:d:D?iQDUi^}{]Z}QgTj^v[?/"Ya2 @F
y)0k,eBJ$k(]B0@BIvwt'z6lM'w`)2xp2{=vW}xnw^=bU/"V^iE;h{)i/p-"N;-
n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v_?m2`g4)yo-370"~|m_
Ao{We_IR~e<5>|Vif/cv4
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'Ndl%QG
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[K<t"
{/T>)7Ll(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[|!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
4h5ao-L(QyOx]I^{*}q^{Kc}Q|=cvL?w]hytV:&e/c|^{1N}-PF!~zcOJ
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<y?9zva9a-g<yX@@@:._|1rnvRK-
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wv%4j{GwL>9K\_6X}U/i?>sBj1UV^;a'n]sy7nc6pz7YO?,<\_!Plz?D>[vi\_/z@>`+Z=3a  $\{CG;b\}U>Z$ E&7VZfnlGkXVXasI@@@@@Z3<4HjL\_zoTZ78oGr=\$ N,z2j!I}f?v'Bv~ A?dv}oNBd~9OnnSjg]\_y]o)j)rQjuuu>a :JM0!~%Ez?LV9Tjm ue\_\*T:@,6@7mz}G==&~r8:LO`cv{<>y0 @@@@#DRfi^[6]}WvAs{7dy|5iQ)it0 L\*=^|"R:`G}O6y]u 6;;U[n|m<8y<92o{(c+.:cmZOLmD{I=Pj\8%g'.'L;x5@\*Z=/i<wx) D2p<W>~{1z\$]`Y/tLyIaoHarmWxS?g^{5l~Uw/2NIapxWLOG=a7yx^P&NXb]=.5>nLS!\$xjv#S\_x\*\-~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@ .RE]zC(:?;C|Ja'5 Tdu,^qufh}eAG/8iV6q<{Ly =\_4i3lvlsYMSv[OSpbx0`9:G@@@:r\_|q{KM^Bljx;uUWY 1 klOIOWd!'Zn.P`\_^z{H;l6FN9j\*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5: H:196 oz;k/= fm/ ?|;r1Tk,.8!Mnu` {6\*|:Gq4p77m?N[>TbK\$! 5W{Wg4(\_r~ s:a~~=j5RJPo]/ol`\_?Yn64@@@@H<#l 6(N;[lAm9n5GW%\<y/}{i>Pemj![{5')@]tAjS~9\_lQw8{?.IS@`u[=9cg~gA5"><XMVy 4&Iw ]gWqa@@@@|.57kv }+N>;^)7?{F^d;mo}mZa FJ<RxF5d^0Hp26+[.oZT`Bc(-Bv{CRK\_~5oZ[#?yzeIv}tw?m?z~<dv=oI q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG  $dZa>d |11Hx\{;+c((G)|N.\}[^z0o]|yU^~u[h3]Le]6=tma$ 35OM{Dz])]zi6),[50WWWgG@;=Id@@@vwJs~vM6B=3f'H}9\$` yyOx9qo-3g}I}8->nj{%^Kzn4\_sXfUW}p6eT Q??aw!<cvo^qA ;@A-a:`]rknkZ<D>.c?\_:K.Q8=J^SO=UV4f5j}D;L;+{z\B!+~:8s{in|/oWlytVwLz &2`x \*a}A%+fut)Sk\*wMSO?k8&;{Wpgz]"2 ;{fwujK 0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B v?5)yzO'K.}cCWEWTm>xm;'f7[o{eYO>b;#5Gy7J]5xO<Smo%kCoeg{otOfW}a\*/MzuAX:B`X >I  $Bww/k_{<yd}$ ] 8~`^ ;dImJw]t9)b} |CB@@@:@N!wg  $7bSL52PRpE(LiN_w-[1N;l|b&K?W_fW]!jC~dkzzs]rGvp+:o5$ <6[m?Onw]wZv]  $307>e'+/e!d.mruzKK^L|U$  u=B=m=#& / #/l=2@@@B +f TBY;)s}0qfO?y?5q;}< }-Zj\_mn!<a7x8fc7fr7hn6xE[j~\_vmXqW^/\_z4\*jgybO @#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8\*\_@V,<('zuYO>uX:=:~ z|Em f^v!}W15-oz-c~@@@@@PK5!0mt+U\$ZR@c+.^R\nO\_]+ 6grsRg~l=9n2]w~zK.wo\_|%g& @C =xL3f~S`jS-(0gNBg ~[\*;\*hV?}]uUvGZy@`!w]r% @@@mJnkw-EMBt=RYKm;ng!#hx8v&{)b]tQ;A@@@jCqj"2KA5q}&cWAjiu4n8O-(Gd@@@u}nOaEK.wheUW.d@@@@ZrL^

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mcKuMO/:d}Ikh@@@@ 21%%1:H.]-L4fZ@@@@@@zR;I <<g f #"
  R}! 0#xv
  @[
hKm < 0- m)-w@3g{gZ*J'
'@<U%[|gmQUiW_}v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s}4Fe_|E>}t9ri[IT@|Y=chY @@,e1 Xr%m!vwyvg
Do/x;umege>[j_~e]P(7hkYf0`@c=>h@N8[uUme]\pAp
onr}o!zvXb ;*8;`&
 @ h1J6;w}>3SO>92R{~Bc
6 \sim 8t - n Ut
7c~gFzg}-{=DZo=cjvA/l.]Vwu%?og[m]|9sBO?pvGy/byZh}GU\`+Bhu~KCv :Z"m*s=8~H;Sa
@TSr-]ae7?dwjj^hD=M@[
uQT{K?O]ZO%5ZkFKZ'W*W@U
@>6zhIl sN U:w}s
-qy4@@ :lhSp'W_U6R=mmbKZLw]H7B}?tv5K qA5cu?vu u?
@SN 4(7n.O
z0;C=44A]s9^+h3iZ@@M sk&YD&%jCYeY9n.(gbsP]5y*g\gq?ymqc M6-LVAL^iim}yS5Y2y
*{HclJ5PkGkAD5Joj-w>~jj\N>9Oq?X5M%+/<ukM{@amu}gCD:AIg%0lZyD@hmvqEFR9?~.0
zmkxr^xoBmC-B[]~{[$ j/}.]qsOY;ZW#AF1"f7h#>|xnbMl\n'|GCrHJDji@I>T?y]Ue=OBM[.j;%/Ew94vxM|09F5!
kW}?Gy$L[q2,X+i`^E[o;t?O@C]4mnv,H%vum/Gu{B18*9$C{7]OU|\)O!?ePUrK\~T&et{#}9U@H]E6o_>VsxyJY
mdkjZx?-RW \sim .IrwU^*
O[Y^(4Ht[D.(K['xK^~U;|7]oVZkJN]GmW_m|vBs{ :nn?7f;cm%wS6jtF]KU{
D5ur-*M{X`J'4fKhneJyuS,k~6-
qt@@V^Uc>.y<wNy!A^?|#q{9^pSGmJ/'_uXP&/L?^SXr1zt/n^dyx)y@:y<wm?<^xh_}m4_:Y?Oe|2i0O/O06Wj&`
Gqn+hy^ QtwC?>fonKn}
vR|q
^s><pk2^Y0?^OG~<`,.
m^:o}|\/>Cy,{ :-
vE1_G~/qu,(:lkPi-<U<@|'__t [{Y
sZl!,@@Z @MJo?T0J4?*&i6T(
mAo^ky,,,a#G
a*8zAS@ATA? 1it+^S+//
U}9[o1Gp6B@@%
G6|p^-
(((}?W~kg&}pj9?UWA
K)k
Ztczt@@[o
i^5sy~A1WPXHG[01.0YSO=5 :jyW4?^3viI*I'ul>:~6kHeWsN??nlT_|Q60!"x./1+a[)lk-U-
BC!}<]OTWTX&yn5/~M>VFtR5&dy
>U^zFM7h&Toz*1w+:3t{+!f+?}.kk(`h+
Z O~UNwQY/z0O9jV(*xkY;$SeXiDi,W<VP#T!@-uXC"NS@-
jA}2}~y/_Wqe?la7uT+Dt}1TAV@@J@U|keK5`@4T0G
I5CR?TQ?IyajekY>#w^&}dw9F~.pRLLJ{P
yP!NP*k%H*+2YmvvG?QBtE\~XF5)m
y: Pl}%
?f
```

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LLt8j*EzX* +jSkG~xXF*TT9{
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RqB6.)h]zmI0k\*WtRpLt 8Ic5OIRX|e-XnBtJBdige j{Nj>tN^@TQ-3[VoguywwlAZi=]]Ae\_-T3\$\_3i <SK;#-" \*x>SVyT`Wl0/"`V^T@#~ZqItT @//\*ubqjA<j>sux ZCm]1?-%T@Sb7KtRK.lXNhH6 =+@,  $0N4\bWHyv_Tl!o<N=9_A\%..P$ lb)v{6X\$"ps^ LN-jeTN%\*W,pZ5g\*e@s6+{Q7/U5eky}P5UV:+BN:(X.{#}>%T@IDATUT?}S` n\_nrIT8KR-W{>c95z:PQ: Pebk}e;-quUl>VEreQdZ/RtTs 3WXy<X\>T|"@\&vV"Rs:'\*Uk:Czy# 7xRyuG<>Zpa4AR5Pbj0/Bym0I /yM0^{5~0Ii91^\$y<Kfx!rJlyuM5=&iZK^`e N#n: 5?A5bMu\$x@|r's^<ws41ymq-@#,}5t:\A`\$yO/9'}y}'W"=0{/M/\_5]z(G`z%81,Mk%uBd{tUBUM8i<`j?[\zaya5jTk^Av=nVrz\*i&O@0L:~Yg'D{5}] @JZ?({YpIU\*uOoy4Xwf{-+%]1QvJY[k03:}%?<A<2pYzyZmP Yq}\$c\$, t&\_9fgyuox|SAw` }|R@`o^@Di]%-T|]7SA[ytOb)oui  $#5Ov)b^{Uf} >1. Ftij@5+{w} -b|L oIm^{z}e-H-[$ RI(Z]IB]\*|'3uZk>J3c!hv-u.CA CRhV[^a UV[U`4lS [X Fm'7z?o[Y5uy\$l,>A]0]1]cz]83QR7]'VGJ,UgZr\*xlL\*Z?{\*lyzc9p=\,^'9^ '@@l;{pL\*oN|4Q?baK\i 

^P

 $n+x+j\&{sk}$ 

-y,lk7j25j% 3Ok\:,iU)Mc-8/c1mfNKi[[;^~`>Lt-LS+&PTcZ,g)Jw[yUzn@@ZF@8vRN`r%^?Mct~

UXG7jzeRJPozxS;vj']xnTUR)[LRjW9Z[{8:@nBZu bMP+>Cjv^K.Osi1n\*Smuu'

T`Z\_sBM:5T?//S=unOx3jsg6Z]x SoguU5Wxph+v-Uy,\*'.W}){/)B+ZkPV-^

+u#:4Ku%@JM0uZO2k1iC@h!-6:CKugbUwJUit^jGTV

?5WI,tJ/~Pj^g^=WJ|mV>mWd\_{^[Knj;S /

 $) + @ZO n\&EsV, -xU[ryFR6]N-q-B O1 \ Smwx8G] qEYbKKu/-v'8Fj6, |>t=P$ 

 $46 \{ ijn_n C = b8Jm @ZSu > xq) \\ o1 = MK"JVh \ \&\ b2\% \ B1\% \ B1$ 

 $+ ETT1J*XzsI\_, \sim J > Td1cnM4KV \setminus R[K9P[om\_|q\{PQK)ET9\}tVYWX = g'i*XH + v_01R + t$ 

(w)8~m\_<frv2)@R6tnZU2@-I~29{&kjm~[>jrP=7MSkH>~|S]|\_)3Z(mVs)

Qp2/)`Z6)P{

U))'Upm"m?u{Gj!nG@@ 6b/PQM'TYk?b5[8PPMVYoyI?TIM45c6qcH??q(hR3XRIkT.dXhzQGE]LdF >uE%u]:>JB

 $E[K5+?SC![W#|h,=\$/g]T0r(oRb7"sn^{0}k^{T}Mn<0<!kU]$ 

\*T!

65(R,/j?:/F0+QAz]FsQz?eUVm@'+~~[>:S7vO}?{b8?>\*>GRR!\*.%]

 $SUZ\{^{t.})K\ k6Rk)^{JZr=9wX}olx/Vj5.QwI^{,BC1}@@uKbUi\#uAY+2mkN^{*e^{5^{,2}}}, ?$ 

^h iK\d9T7'Z?L/(N5#?{wAV\_

|[Bd}b)YW>9#x?f<PQBdlyYxa/(xMXfis0Y\_k57O@s

 $\{|SR>dW\qE2drD,y02rA0k+:\&o_S?mb,x/hkm[4^c2Y],eGe:?\}Lo$ 

 $9{>}F8s/lpz{<=}Fu\}`7Z_TJux/yk[9kswWO^{IEljW/p.xkl^{gB^u}|{<}dk$ 

k;)~hc-u2@@VPWU%U\*~XO5^t

Y}EmNlq~/xdy?KC5mz

^{\*vy`7bNuBio|\*H

YGiubA^:Z@@ &)` TBXpk10>P#nC@5?}ULZ}Vw,\PSTn@Nm-We^Zk`{zh/7l5n\*4l^Rt\fM7[\$L+UXX9Zss>py(Hup[\$LS`)~e\mx >r+~[>+ `i\*yY \*LsHeT}HjIb=.pW9UCA6J;-Uo[y6dHjz :L f+!Ts \* '=C2B'W5Yz:k[W~S :d<A@huNvNOjG~x#ED|0PN5IA,hPxz5i\* 7T&ov]b B=s85Z13!](S-t~ bmOA XG~pQA9|`vCh!Ki\*85UEK@@kpo2"#`5G|K%.RxI(,VM/7 Y?# \*W!ZQK9'q[i [; MZgTTy\*z,{J? h?-sSjkQz%JXJ\*SIr\ONA]|&\_Wog]!}V5]WK= rV>JF5U9#+}7PAZ6{\$ <<}GL S E\*.%PKU(J+FZ-[5 +gyfA!Jt/wtTQlmRN><Fc @f1~b+y]SYRvp@-?\*Zi7 (f{MzB av46P?-\_uVzygfiqyY[OZ{[E}\*+/zj M/D w}5jW'~ /iZC^(jt.#'K4,m|.rQqjA |?mSya^=}Bx V4+>WyT{ sKcoI+Nnw<WPg \@;?Ad(xDcj[ Ι d`Wz59J@@@"[@>= t6J> 5,@@OYG@@@@@\UXZD@?n  $JB@@@@@^*JX@@@@@<id@@@@gJT* < id@@@@gJT* < id@@@@gJT*$ @O=g!5!pqj"d@uh!l@@@@@v!@@]2 @ @ .N@@@@@@uy 8y\*LC@@@~>uG(@@.@@@@@X:h@@@@@ hl D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\LD@@@@@c XA@@@@@ W@.@@@@@X:h@@@@@ D@@@@@:u>9@@@@@r0@@@@%@@cO@@@@@\.LD@@@@@c XA@@@@@W@.@@@@X:h@@@@@ D@@@@@@:u>9@@@@@r0@@@@@%@@cO@@@@@\,LD@@@@@c tX:5k^E>jDKK.{X#& kffigv! R]puz.E&@@@@e|aOasjz7|0d= We @`vj'jksUNDHI/ 4\_@X3%krk qiituFB@@@@ hke4 "eUt]) 2 T@'=-} !YKo! t`hpY'\$@@@@Z@l:)Sly[Q\("`{^cb4Fc7Xb4j5\*1{ o}>n{9sJw~s\@@hIZ6,7|\sMIM0^{m;m%s3@@\*!/?Ywt\44'#GonF9n7&O-B}:TU=nu~b~tV[m5Kk\*@ @F<Os6sAwn~u\_| f,W U#lCWd=eT{mUW) }o;e^VX~Y[j!e&hw;N;zCo=ONoKh8\_3;{6qb]zwdCll>\_YJ&g(}]{;Y?fKyzt =zxZk-kmVc=6w\_!@ @ `Bj 6hzGK[6~]r56nv|hN7~so^M'=N:6>S >n  $_{y*/\&L\&}tu{G|9^{/}]ofIvR:gxWW''{2u5c'7n7}~7'&y28ze]Oa'oN)y:$7N9~m%(Y @ @$  $6Xz & O \leq U \\ WK + wg. \\ mE \\ WV / wc \\ lc; \\ [ljKlSNg GahpY, G`_k = wm^; \\ Vc; \\ nuzG > hDr2 + ?f^*, \\ 4`A7l`/^|U \\ C_Fmwf^*Z, \\ How \\ How \\ C_Fmwf^*Z, \\ How \\ Ho$ **OwREr** 

 $v;![L.\1`UiK/gk~5uckGL+6x\#]|Xsy{Zuuq7>jtGvA3~30f3a}74mnw6ulCgcfU0n.v]wI'\& @$ 

@ P"`Hn M'FF!4/-~fk[z=sM6 O?1W. #c{3nrMk:W,:imQK+>}7c /gsoP^};bAZ831^fdM: Vzu\$->lC@RWFn=1\$mFWn]bL:+=v]|O8`4>V2;.E0O7xh7Q[=pr]M#"o L/]fqel4;1q3,Q?; @ @@.Rs)S\_=g1B+ ehv's8k:rhv}}`XbvdkzXm,>9<1gO[neMkLnqrH!Fgz3/?g-\$=Sox?g=c@\'7|!iR vXo4Oyztz,jg р % @ @ C l'O.mbk?j~1[]eEZkVlgE' $aOd^{6X}F^{q8blVnNkWJ+X>tV>}^wM6J+r#({|mtvXt})$ eYA^9 gEXw8V< !zMqLNlj&+ww5|f |ov >Tg^i7@k,z'.~)?'o~<yvr86w@=lW;Y.2\v6x:3fG?qE]dwq]qo @ @4F W]?z{7A@.c.{AnL8#uos 3f@u\*vqGa`L oEX j!r\$QP<Q!Y>%]V.s|oqnTpj}Z/Cj{j`I,|&@1/+at?>.TR:{g~h2>FI^{4;Bf=-}7[{lm-g7@ @ 9?v/ `/=!#GwAIy^juW7rF\*CW\_XO?\_ynyr'V\a9[ )p!o\_oq3w)oy@`/CROCYy?7.g o\$l]:n{.N\$k,]}t6+wYc?QvE}9 7K\$cfuq1@:?^&Y:@ @ 0E2>lS(|Dmf -C{n{&xN;l?}Zx'crv\v9T?fg~j|m1`/{a%evn+ymNu%(AgmpD\_- $36|m] < F \sim |I.e|f$ hE-Dn\$|-{|nZCnc 45<v}Pw'&f\iD)3nv[AT}\g.Wd8LO /AYv?AM+B @ @@@#jLi6,z<}7v>~ ME-~`1 K L= r{NwE\$9^ggoW]{wv,[nV^x1a;I5fhkXnNvYl<c'~igy}i<~=8p^19SK>j?pXuI d Wbm<\_\*j<w)

```
@ @H/[=q,K?+jqy~{s~a{mL+?yJgg*K < [lK]w!w~4}]q}I
```

1p5IO+>>

```
\label{eq:starter} \begin{split} & 6j \ d\{jcmuL-Wi~4^pX2<\!ERV`y4KL@ @ P@c:V\#k5^zbFM^r3\{G\&w\ 8mXz,K(\%,^=h~6Cn\}N=,+\\ & R8W\_.fh~vBfd~lgw\}9jzOP\&CEo0a7~7M+R@h~\}oO:==?8u2e=g\ nRK[:M\%doo\}>C> @ @ `C",b/\%v1,-(vOMo.zcG[img+V|Ov_X>zWuJ?]tih!gg!!/U&Zs.&3U\}-nv|sCAkHct4mf3;Mbg]p6JE?g|&Ky_wr2ey- @ @ { `C[nisOW&lR4nrxoNQe{W_veY.>,oP)iSJr~8^.PoSk_{}[}U2iGquoAfHX{5a.11WXonZ^hMbOvQg%LB}:G&|e;y} JP;f5hNn3Lf+ymeH98pqv_}U"' @ #nuQ}q6p<=2jhCP_)R;_5h"W_&H\%W/d]t>\V-N+g)P^q#CzJ5b {k^H,T$fq} Gzn=D \end{split}
```

```
:i!vP=13)7lUWnXc.M29LWml+VhG%" @
'j:t`<~ZG+SO>mtvz)XZ<GI^z\d?=0mz2RK{zy~l&Ct^\WC~t.<(5L+e(& Yxbek/rMkq2dHR-
zd9|=b19+gd?n6S1@Xq32 v~@ 8dA @
r$z,)8>{'mQvHb9c(D1bd\mtSU`WIpNr3Okqm.=}a{kdrK\b`[z:7`nW;ej;.<n-Yb%o:Im
KluxvRQD=L]]T~[g'E\:>P9s1"|28< @ @vsoBs~
64C-)Ss7\&4Q;6[Y]781c}y[]py;]iEUsO[vI^\0y6,"CM2:V]eU;o;roE.l'tMJZkPg)k7_F`FNy9jzW2|}{+{Ci
?.F'_Ly{["1utyAlUD1Z*u)0B @ )QYh
W|O?.GsB[zi
=
_Am.?.t^x
l[:cO-f]v/ecgWO<&}dW3O0"aX>XmOlukzy]Ng+vyg6(:kd
@ %P_;en>2/6q$,AaPqz?\/;FGG`g7LK/5/+^`H1A#[v7VV[ehzd]tL+-~Ps{3t5RX F\]f;`>c'xM<
\kKilYbo}8Bh6
KvveXbX[Y]:l00z:wV^G/[~[*]WPg=4>C k/)@ @ 8yGU:G~ReA?ZK4i{}
Hh}'b/|.ju+40k>o>_5z3l\K)h{6WV49wp@V[9J[m*,
X &/7n3M
```

s%

```
x7mW3k\{9@ @`.'>e.> 0CVAVS=A?_x^xV_\}MU(\{DfIOL\#vip&O,\{iwygX\sim,!@
```

 $\label{eq:locs} $$ 'AeP12Cs<'lo-:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @ P>+J 0A`F0 $$ 'AeP12Cs<'lo-:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @ P>+J 0A`F0 $$ 'AeP12Cs<'lo-:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @ P>+J 0A`F0 $$ 'AeP12Cs<'lo-:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @ P>+J 0A`F0 $$ 'AeP12Cs<'lo-:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @ P>+J 0A`F0 $$ 'AeP12Cs<'lo-:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @ P>+J 0A`F0 $$ 'AeP12Cs<'lo-:P89u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @ P>+J 0A`F0 $$ 'AeP12Cs<'lo-:P80u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' @ 0@wylBp!@lNzzsO?=exsvhO1N^mV_+v-<gJ[# @ @ P>+J 0A`F0 $$ 'AeP12Cs<'lo-:P80u\t<7IDAT?.XSlkG\<F61uC/mx' qEr' $$ 'AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP12Cs<''AeP$ 

tJ&k. cDYsb<}gq#Gc^;hom ``rH-C @ @`&9+F 9sf[h\*u%YShB-dmUWz>4/npX@ @

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0C}6z{QiAmIk3"%\2=ztLb^~e[fePh
```

@ @h\_!Wnm.CKJJ3-OXn~1@Z+c@ @ 3@]lA+7/<41l"-a[@ @ Rv4M|5>,AwH1j&hBFW @ @ ("@%eTw% @ @@mC6\ @ @ `hS@ @ @jC@mR+ @ @ @M N @ @ pV@ @ @@"AM@ @ @

J @ @ 6Ecj

```
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```

 $HhOqL28\&2,3xZkm8\}z8hI\{3?O<\!\!\!>\#S]!\sim$ 

>E @m"@M& CAl;lG}}&O>".ZN<puYUXjO?h-M0

mUW=z!Coo=?hV'l+7|KX=mu?O.0m4lwv)Ur

RKnhzk @hYZ7G P}&O?]c

+A):AYeo04g'Md7p5vu:.\,x7\_|akUANv[xfcvj/f

```
yA. \\ \\ 1=z?o3aAg \\ < @O-\_\sim nfs \\ P\sim x \sim VPN) \\ @\&M_! \\ 9lwuQvu, \\ HMstM+qJd.M`a7ki+r8ZUI \\ @\% s1-T[)x \\ + (base in the second second
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 $ifw F?a \ */Orxw v rUWAUVYV_{u+!} < 843SN \ 22l/0d:I$ 

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|G[nPFuh\_{<wWLZ:'pz>o

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#FZ. ?m.F_r%E'o_d'w
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's9IR9K(F\_>k[

\$)\$>'NF\_XRF

r'RnQJBr

```
\label{eq:kF-} $$ kF-}/Vr.L[o4=TXguKCg|UDI~|6Y^1QLg$r.V_|qxK-Y']_?W;V[-SQv}w{lWT\%} Wh~:~8rH;lA|Mnk|_1-m^:z(fmVyYi)v[X4F2~E3@.h]%gk<~wIL+w2<(A/!) $$ with the set of the set of
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@% d

8qB8>

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d[B>y G}tWGYpe\*|wmW\'e+I

```
A^W&Jd;/oW|t[AH]!Qp:b-Vt_Vjo}&[BNt6]pe78FcG;DI3r#L:
```

```
qh
```

bqeJIDl(xPX<Y}

```
+B{y,]vi}-x^{\}
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!O?Jt

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nNK1\=y+6'Yy]XpCW<H
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r*nMzT^_1
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```
n*.8^(*)tg
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```
/g += \{:=)K; bRS": VZ^A A^{..c} u \\ 6JO8vcz; NLsChA7Ao7@Ume
```

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RxKP\% #>>pDeg[Q?[XxC0|tfY]r:?_4-Y2H6i[n 4Z-r''E(H^2xe)]
"-jo1.o]tAA_qbSFK)GNm:=nhpetyFF))$O
z >> 0SLh/i:>^=+Q >> K3
>C>o)+U_5RF`13txMV<VF*d|I_NQ'm4ln^zGO'[%O@Lu5$e{Yi:?jM 2(A_K>}y!VyvhPu
]{%`8hDK~S22~dE_s.>`&ZjA`=;C//x}k=+>c1ylVxiL9RA
>{{c-@-C@p(#Rj'c@v%l3Fh>$@KCFeUg$@fyGw9(#welvBYI#FwVIL+D&F)qJ`R?ofKKwI~/bZAe41-
iR7JA%ig7[M$e#)Db%-jw{, vRdFSGRrRjU*w?<kx8\J6.6Kf&KiqLyzj)gV4:Vy:NZJs7Rve
^\>=1h4C2YU&{Nq6+i#f'R*XRg<OVQYkOn>TeTVA@2y:Wy
<o&C43m11
*.|VmbYJPKnkPh/6SL<&i<3.
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WPJP{$a=l5JUn;sClv:l7ee v\;ZL}tGR@Rq%&5uxxl[>64P7{,dEA+e,o_z|C~Z"OZS9'?TB,E
I@lmL1T|U<Yc5WGmsXD+%{>E~R{QuU{.c]b3}<m}
0/BZ'|E"?kw<R^Sz?]"b03a[tgEB3(2?Yb&g+pmkPD.]N= j*6G
a#45WuJtVs
Q'UoHc7xKT|#)i>!HG
F$g
@ rj>[I?ALuJ|SLnAGCtN)|~:
,@1?i%d+Pc.O\J#KbPrM"B4(P]{wA@J<VWL*b1bUMEH^Vz9}L+*ilcz%vw71x*Rj,f~^9W
(R]d$4]k.
U8O:1e Mkz^K.#+<#=x>3^\*JsS/V)#$[neXAJ3iV*3 2k~VDKFz* V5W[IgR|RoYvs<;];]R,b\Vs
FzG7:u mQ|F4dps[=>|R/)Yg @u4:@8saTjS<bd!S(wR/+^Yi|^"RI$MEmM7-V,(Ug,_`
3yNZ .)#'vk
IXez2I
fIA^l"wWE_c%zsneKKY0*W[kRu]4*V3)RifDAJOhwwr_aj-Q
{iRKlwGf2`DQz)@[X+AVK=K#m<B0z1{?ok~&=w?4'}mSF{}W
z[nLxR3QRyK%|Rl-qVf,>-</Oc&Y")S,;\!1N|@ 0CzsM
6Re>d}$*[bi
1?7u)C}q;SW/Hr;rj/uFi/}N%~V)%Rhr$w@>f'gf/Jk)TZji[dA0RO>&t)t)2$no8F8=OYxIK
}RL[vM|8;aEfhFPctTjv@{%qFAZh\0Um"/!>8;#Ul3Q*y3bCwZwT`|W?R3S
w.tv8s1A!O%ai`tAKm!af@'MA9S
@3*6W]ItTiEzcz &4)=p'|thVrFii$TkITJt(V$-9aLzHx97Fjrz4hk7v/e/r^dYjk[orUJK *A@Ne zd6~@6kbc:Ck]
XE/[9)tE\Ri4W=A2hFgd,(H%~KLOV#Eat-ER{b>XOzvFjoPR5>iGs6UWrnp]eReJ
fehK$D3oKQlC -)FIIRYGCEHiMOeT~)N)]^@Tiu[Cs7^7WUso;M]4{G2DjdF@
iFvtlQzk^=J[ySsmK3J\hwFPG+8v[n)t,?bsK)^=1"dMO|N]AQ
r%|100n4G8s-51g5BA6H>c<8{ td24H'NSRB3tM1SA[.z)r#KP^W+@b
=dtA @Z.Z:zZ%CSE>RI4"?-
r'!ED1R)+"]*EDJu)
EEs1--v B-!9QR4u~Wl{Jo7}rK,>bF=xx)Ys.Qr"0--=-bAnWt_#74 W=
H1j>k6dD5pGnnn(^34 +zg^pIr&k,n*osT~h$10pWbR7rMqRBhDJnqF3ed(3L{`=wry}.yaQ^7)s'u4k!@@%0TBm.G
G]VY%F_}guVU}UG6-O1tiyeijkpKhOgzR?H54O-WJX.*QR}(R`RGAu-
"^krk7`\r~1=;.P<}$R]/]T"s+,Iy"cFrK:lC>mV
K,SJIV-
%`Rl*($*FW{QlsH^}`5B'2"AZQYX+m0@Ky^V[l.I2[W{gn1(,*'~kKzvJgeiy>LsK|fP5xa{lkfKUw+]C5iV~w~_gE
Y,*-Rm;Flt{5;C 4HJFZ+djq,P
```

 $\label{eq:constraint} $$ [lE?^>:W''$Nr2/cJd]`\%?\%.B() #>R9IVV^y^^ cIg''qU7, (pKwK~\IrG'a) $$ (pKwK-\IrG'a) $$ (pKwK-\IrG'a)$ 

qCEJIlPXkP\axl.:>^>>i=!}j7+'^qE8^wn-

 $DWrniPgN rAQ|M!2[L|[]v\g4WL < e\aze; ?S|x+B?]U+)_{\#} < PF^{:+}Ae\$, wYskg9Q$ 

 $n19YVsNtOV7?y]uO^{t1}=mvghBY\} < DRF\}Mu7\} > nXL \ Wu-rIzvONi(x3bs\} < 6w\{S^{L}\}:zJrqg|k$ 

m# @URtIYB03P9#%W-FpR>4>Kt@5Pc^~OcR;GnzrN}Rg2\$o)UAvEV-uKiefd%\*Nu-)#b)5b3R!|TiWiB-}1)%CRV(&}N{)I\_5}vA7=tizkh /~6[RJ/DJXf

7+J)}>Gyx/Vs. )G\_'e|{^&R~kuGZzu9ro,7`B!eTR~D^\\ yb>;:~OJ,zdHdXx7;kPqCO:@\$R2gE5Y~2f1Ik\+1 -2zgJ\_H'Ly>3!nr`yX\*P

 $\label{eq:2.1} Z@".!D>zpg t \{Wp+M(obCA2Q/?V\} \#W>hc \}.\nBH5\$'R p_k2 \ \#u\&/B)on82[|6kBMU \{+r7Fa*|Q_g+AMHPZ3:K>^b!WdWREC5Dn+Cri"W4c5z\&|(6GcXVAc,<?\hb] \#]UMzF)MOXd5aKrcB\o2\$tt\S;Am=9^}]3gY:<7:OZy9TkJd|Ep^\tn~[>\$sN.W5\%uP5>LaWfJWL!-y7z5z\%R*r7~KE[ @jK`Y69O>/6h`5{tod}$ 

 $\label{eq:heat} $$H/RT"}QM}XM>MFvv"eBTH)>C>d>yn),1EoS<^:/>z6/yI'h;N^Q)uUs.KCJHX\_n5-N2JQZ3mLfC )ib[:IRcg -y(w~KW,'N 3#v82F6NOpv(.Hc K}#z/W~jA<all!]Wkq+}WcS' LH : NIi& 0L(QD2dUUw[3wt^B m$@m@6@@']D.@@h9m2@@@@`9b@@@h}js@PC $$$ 

@ @ @h\*M%Fy#8@ @ @.\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J`@

XM5@ @ @@

0Cp @ @ V`h+gv@ @ @jH@

R5 @ @ @ V @ @ j@ @ @@[!A @ @ @!5K @ @ B@[9 @ @ PCj!@ @ @mr&h @ @ @0.UC @ @ mL@ @ @@

`!\@@@@PCT

@ @ @h+03A; @ @ @5\$Ap @ @ V?&dIENDB`Screenshot 2024-08-20 at 6.00.11/ PM.pngimage/png9 A<J

EnUsI)-V{!77

 $4y\_substg1.0\_370E001F*Z\_substg1.0\_371D0102*[\_substg1.0\_3A0C001F* \_substg1.0\_80020102*U$ 

!"#\$%&'()\*-./10PNG

```
IHDRpQsRGBgAMAa pHYs%%IR$UIDATx^xUOH5
```

 $( bG{/XQEA:H&\#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a_010 aL`0`ca0/d8')QO\w ,,!%;5.Q'{R4om } sn$&&%gRtiZ]v'RJ5"e S"7+e}{HHH7hRZ51xYF9a7}$ 

L(9cwhz),,,2

'Tr97N<)

 $2eut]ZjUm[-"^Z\&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\Br[18x'5"31\$3cr]$ 

 $SR\%19\$\$:q\}uEE:QEt]JJ=[sm~*zn7sQ~6L_/$ 

```
6u]'III~M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G)_~z<o_U`'>z.Ai0d%C~$2gMC9ey'oV+V
```

 $\label{eq:uU=OnfmB><320<ZQ1+W?:WwG:7\Ciy7U;:u^[YT,/hocQF,k']R8/+=H3bDys<5_'#@.x6vcw'JxG>kNm_,/+H>>a8IH<m$Y%Av8]^`W^&L# n-vqq,ID4R$ 

 $\label{eq:structure} $$VYnX1+~)yJz;$Hmw>(cueaE0^/BCJa)hBK"""Te)re^z*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF$.]5/_^/.S#/"|N=zB&Du$ 

7H^]xzu3DK/Tvu\$\$I`RbE];oms\_F}D5kB{9MAL ; |cCoQ/I\*U[R\* I}D!GSw,<yS>{85.% \$cc;#u[z,uNPy iS?BoUB)yv\$+nz(U>+GI

HPHTQyNuRSYP9E}~J4\*K{7mM=d[/Q?JrRx1iXw>5Hk?y0Y\_!F  $W_{Uc1tEF`@1[nUc(k6_b$)RDC]B/dPpMcG}QsBO-4w6mTG\0wWQZ.erZhh)/yP7q7mN) d!F@_]*.$ 12 q1B=OR\*n<pCZsHH rr5w"9NY0Y.^Ifr8&E<|VIJOTX:&?!W)fy27GejjW6OSeo\$:b!=<1:mKw&cG;RCV}\:y[N6J/?%on.t00oe2e,)WDwcd =&0Yej(Q5BGC 64^w?gysZj7F F\02c;S"##5 a6@C55~xft1+5?;PIabL~~?j 4iDCcn5rkOC(&Nq\$6;GI: CP3/'1\$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf iqqsJFxup\*8}0IZyOCI{H\_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B\*54Bn/k('\z `yA`rAp^\$ ru?h[O < -FVr3]Op > lF $<\!\!B"zn\sim\!\!F.inXU|?"nlD}S<\!\!K\sim\!\!7:\!>iOOO||D8g^k \rangle \!\!>\!\!HJk*1DjH6m+-<\!\!>qvwUnyv<\!8]R`<\!\!8zYG^>\!>Ai*w=w#v<\!\!U.JE@\&$ V14#wFlbsB~->[m2."mW#?R %M >5R!]Z90z?((C) uM8hA? 1\_`.\XfsAXnc!6~lb=(3^Y9Amq;3F-{je%6.E;,gx|QZ\1!F\$7DzyW|;wgh\-TYN[0'ieRPA<>-^\*:vm2>&`TMX0W\q16\_CE( CLXXp=\ B > AkO\O+k]zC[1g"+Bc\/b+L7[a\*<5y5xG%GXF{L<}j{M"8675]3?tWg`i6"rzW~Cn~#<9 'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt\$BE4&)O 6q?,\$@^qC/>|; {~9r4ZyUm7L'5/\*#}\_zB^yQi Q&Y!.tV(\_mx\XwSr'wbwQ 3 BE^\exp-?9D0&52-Qw'|P7BKy :o-;^uh}Mg[!. 6T\*z7UB:Go2^+HP rf P<1;KK&<%z~}fxS/(mYp#FR{\$as.;/ecAj]xxF-'88(:&  $O_{\star}$ . oqo $O_{\star}$ ; tFhFzO6ME)fl!, Ai@IO}F+3sw!(\J;J\$=0;X"e, Wwkp|T(\$q)a+a0B10Nc!20/a~0&0a 010 aL`0`ca?Og4ys25a? >#xf\*f}0 w8Pdg1`rIy%@2Y#SoZ|t\*)(w0?^033; >0M7g+b^/#?ff,b\_7z>|coF}xYJa^{GPcF`be\_`.1>LLufa7azfka~gj}1\$&OSC;V0k&f|udNUV tRL701# 1/B -^4qpQ[6 @x N7I" #vL8I 1 &m00Y 0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3 7nXgxfF`/;Nk 0L`/@(b0xg< a5yk =!\*[x? />yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa >[]w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad% LLG,;&bkK!rK\$)o\$ BrKHB5aFVOF#'|<\$x\$qew a>vaYla0/a~&?~<x[&;O\_:v"EnLJ<hY>^g;11In|vGK2lf}Km^I\ihcM6?djoK{O]uR>Y#BSofx >xvo|\$wRR34Z{7%GbGl\_]7{t YY>& zHy7ePLqiS=!113Aeo~p%:\_\$%fNLdLrRb(/KR0)QK%:\*A;:L@BhNV;/\$rIhpq;,Z..FGq0]j=\*%hj%1tCLXpB3be\$+ LtHsYlKBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\\$KW6}+E".%iEE JttOet=uP9r\$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu\*/A;J\*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On\_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH\_sRZSjV3L\*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G\_h;vJ.WIS\$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/\*/-qZ\*\$xGi{kU!=nNs.i N $:9hC:IK\%'' < =2h{Zx\#}gD$ 

```
)WS6&@Lx}_+Rjq rcP6pUxXDt
```

 $tx_0 \ r< FIj + < \ r< Fs \{ exiQ + 1*TPH\% GuxL < K = TD(*Wp; vFFOETd/]; ""\ v'_4Cvc]y2 \\ diHSCSCzNqmt: r4v \{ \ nPH5ont \ r4v \}$ 

```
SPPjy(oyjRhA]a5n?qRAuYM\&=
```

```
'$?o\rM/g^L#4py;gK7V|8qBN5
```

 $\label{eq:cmp-A-iKzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55]>8/c%Kh2s+Sd%} o-Gg#GW_.=n=S#}wMEEEK1&0K+v.]/xuNM~3]0k$ 

 $ERjU{+}8{+}Z{*}UJc\_isCd$ 

 $j(c#){9YpH"bPv[u|h5r;}$ 

 $\label{eq:mr_action} mr|A^zOzin/X\{wg|sMtAfU.|\}d*m6OYFw^]qRX1'DvNCs6n1@[8&n2]39O]=Chm&0)[I2ug?<6])T"""hb=z$7jHEC6h kt_~={}!J}Yuq3iBtEi2e/e9R~}Y5o.+WVC5IPGKhYAP3g0[$ 

Kg2\*m~e0m~|ma3<2l&MTSO=ke.k>/|7jiyLS`A;{O:v(7x5k#</>@^u-7j\$z--S2dxSLyjm:6\*?

 $3^M7e^Z-1?; W\% y8_8^2qD=DvZJF4nf=c!@>/8/\%Jhjr}7\4H<?q]w\}v?, [.[bEiVfmjq"-aC!KK\NOA-C)]w$ 

 $@4Cz!)_{;zbPqc1cdK}C,042@1v0F[v*:uR1D00?FM|FlsA$ 

icuZlask

CI1 ZW\^#3x |G94i0.qE9a'\_|Q@0@P\.RT

D;vnT\_V\_V-1b@;}QYBiOOXB/>xB#c\r.?PQ0`5gF]mFg8

Bx6ia.nY\_{qA0 wQQDopRbOo#q+@

`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T

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W>N6\#; \#G]C[oz-Zq~LgqFon\#2<Q8?`ct8q1hy>-381\#Gj; vnIvy\#iFcq~.38MuyyK.g:t]
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\label{eq:constraint} U\{<\!\!/1:gdxq1z8V\}3gz\!>\!cHsgK|_{OqFG}\{n\#zKc,\!=\!7|W^{"}=\!zwm5kmr=\}/\{6m=mqo,\!YSOii\#`G4?m'7nlRIs!m8Q\#~gpyG<\!GLuupZ;qxziy[gH_<\!!xSi(^<\!\!>qwB_pnU
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00000003<h_substg1.0_8012101F-00000004<i_substg1.0_8012101F-
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# 1.50 microsoft® windows® operating system 7.8.17763

## 1.50.1 Available under license :

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authas: Inference Classification Result Client Info 2 Current Message Safety Flags Entity Names, Header Body Fragment List Has Quoted Text & Is Quoted Text Change daccept language 6 Conversation Index Tracking Exdx-ms-exchange-

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antispam-report (x-microsoft-antispamXx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-message-idZx-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-crosstenant-network-ms-exchange-c

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 $authsource>OriginalInferenceClassificationHGriffinInferenceClassificationResult:InferenceClassificationReason2Cl assificationDiagnostics2ConversationContributions,ConversationWasFocused4TriageHeuristicsFeatureSetBGriffin TriageHeuristicsFeatureSet:SharedWithMe/HasSharedContent,FocusedInboxModelScore.SharedWithMe/HasWebL inkDarwin/Url2.0@EntityExtraction/CreativeWork1.0xEntityExtraction/KeyPhraseExtractionPosTaggerTeeInferen ce2.08BigFunnelCompleteIndexingEnd<BigFunnelCompleteIndexingStart,BigFunnelCorrelationId$IsPartiallyIndex ed.LastIndexingAttemptTime.ExtractedFromTEENetCore_substg1.0_10030102*(_substg1.0_10040102*_substg1.0_10060102*)$ 

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3IPM.NoteLicense URLs and Parent component details for Windows 2019 LTSC

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02*&(2PDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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MMALAYANMarimuthu Malayandi (mmalayan)@B+//o=ExchangeLabs/ou=Exchange
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Administrative Group

(FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f14858\_substg1.0\_0040001F\*5<\_substg1.0\_00410102\* %-6\_substg1.0\_0042001F\*9.\_substg1.0\_00430102\*\*,:93feee6a76ad1ba6-amakothaAman Kothari (amakotha)@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANMarimuthu Malayandi (mmalayan)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYAN\_substg1.0\_0044001F\*=<\_\_substg1.0\_00510102\*+/>\_\_substg1.0\_00520102\*A\_\_substg1.0\_00640 01F\*.0DEX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1 substg1.0 0065001F\*E substg1.0 0070001F\*) 9I\_substg1.0\_00710102\*L\_substg1.0\_0075001F\*24M485893FEEE6A76AD1BA6-AMAKOTHALicense URLs and Parent component details for Windows 2019 LTSC image6G~M{nHEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDL\_substg1.0\_0076001F\*N\_substg1.0\_0077001F\*37R\_substg1.0\_0078001F\*S\_substg1.0\_ 007D001F\*68%4\$T)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8357352A9AC74291872DEE4575F68898-MMALAYAN<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.pReceived: from CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17)

by DM4PR11MB5407.namprd11.prod.outlook.com with HTTPS; Tue, 20 Aug 2024

12:38:29 +0000

Authentication-Results: dkim=none (message not signed)

header.d=none;dmarc=none action=none header.from=cisco.com;

Received: from SA2PR11MB4793.namprd11.prod.outlook.com (2603:10b6:806:fa::8)

by CY8PR11MB7747.namprd11.prod.outlook.com (2603:10b6:930:91::17) with

Microsoft SMTP Server (version=TLS1\_2,

cipher=TLS\_ECDHE\_RSA\_WITH\_AES\_256\_GCM\_SHA384) id 15.20.7875.19; Tue, 20 Aug

2024 12:38:28 +0000

Received: from SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef]) by SA2PR11MB4793.namprd11.prod.outlook.com

([fe80::58a0:85b1:cb5d:a0ef%4]) with mapi id 15.20.7875.019; Tue, 20 Aug 2024

Content-Type: application/ms-tnef; name="winmail.dat"

Content-Transfer-Encoding: binary

From: "Aman Kothari (amakotha)" <amakotha@cisco.com>

To: "Marimuthu Malayandi (mmalayan)" <mmalayan@cisco.com>

CC: "Salil G K (sagk)" <sagk@cisco.com>

Subject: License URLs and Parent component details for Windows 2019 LTSC image

Thread-Topic: License URLs and Parent component details for Windows 2019 LTSC

image

Thread-Index: AQHa8v020JWnR34fHE2Oj3tu5q9IEw==

Date: Tue, 20 Aug 2024 12:38:27 +0000

Message-ID:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

Accept-Language: en-US

Content-Language: en-IN

X-MS-Has-Attach: yes

X-MS-Exchange-Organization-SCL: 1

X-MS-TNEF-Correlator:

<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2PR11MB4793.namprd11.prod.outlook.com>

MIME-Version: 1.0

X-MS-Exchange-Organization-MessageDirectionality: Originating

X-MS-Exchange-Organization-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-Organization-AuthAs: Internal

X-MS-Exchange-Organization-AuthMechanism: 04

X-MS-Exchange-Organization-Network-Message-Id:

ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-PublicTrafficType: Email

X-MS-TrafficTypeDiagnostic:

SA2PR11MB4793:EE\_|CY8PR11MB7747:EE\_|DM4PR11MB5407:EE\_

Return-Path: amakotha@cisco.com

X-MS-Exchange-Organization-ExpirationStartTime: 20 Aug 2024 12:38:28.5883

(UTC)

X-MS-Exchange-Organization-ExpirationStartTimeReason: OriginalSubmit

X-MS-Exchange-Organization-ExpirationInterval: 1:00:00:00.0000000

X-MS-Exchange-Organization-ExpirationIntervalReason: OriginalSubmit

X-MS-Office365-Filtering-Correlation-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-AtpMessageProperties: SL

X-M365-Tenant-Cisco-ID: d8eb5f98-55ca-42f7-92f6-452cfa7add59

X-Microsoft-Antispam: BCL:0;ARA:13230040|366016|41050700001;

X-Forefront-Antispam-Report:

CIP:255.255.255.255;CTRY:;LANG:en;SCL:1;SRV:;IPV:NLI;SFV:NSPM;H:SA2PR11MB4793.namprd11.prod.o utlook.com;PTR:;CAT:NONE;SFS:(13230040)(366016)(41050700001);DIR:INT;

X-MS-Exchange-CrossTenant-OriginalArrivalTime: 20 Aug 2024 12:38:27.9860

(UTC)

X-MS-Exchange-CrossTenant-FromEntityHeader: Hosted

X-MS-Exchange-CrossTenant-Id: 5ae1af62-9505-4097-a69a-c1553ef7840e

X-MS-Exchange-CrossTenant-AuthSource: SA2PR11MB4793.namprd11.prod.outlook.com

X-MS-Exchange-CrossTenant-AuthAs: Internal

#### X-MS-Exchange-CrossTenant-Network-Message-Id: ae58cdcc-7894-4f0f-8074-08dcc114fdbe

X-MS-Exchange-CrossTenant-MailboxType: HOSTED

X-MS-Exchange-CrossTenant-UserPrincipalName: 3w+lEr5Syz6Ul7XhnjV+ziQoyeAButBZPWvDHcUEHStczQepJ216vYEgy1ezPTqd4EYOSjEcvIT2xgXlBIYKgA ==

X-MS-Exchange-Transport-CrossTenantHeadersStamped: CY8PR11MB7747

X-MS-Exchange-Transport-EndToEndLatency: 00:00:02.0031318

X-MS-Exchange-Processed-By-BccFoldering: 15.20.7875.019

X-Microsoft-Antispam-Mailbox-Delivery:

ucf:0;jmr:0;auth:0;dest:I;ENG:(910001)(944506478)(944626604)(920097)(425001)(930097)(140003);

X-Microsoft-Antispam-Message-Info:

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Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e590788e86f1485893feee6a76ad1ba6amakothaAman Kothari (amakotha)EX:/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-

AMAKOTHA\_substg1.0\_0C1E001F\*`\_substg1.0\_0C1F001F\*;?a\_substg1.0\_0C2D0102\*e\_substg1.0\_0C2E01 02\*>@fEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

(FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E590788E86F1485893FEEE6A76AD1BA6-AMAKOTHALX LX

Salil G K

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Marimuthu Malayandi (mmalayan)InboxLicense URLs and Parent component details for Windows 2019 LTSC image)EUzgbOSIq:(Zi%:(Zi%\_substg1.0\_0E1D001F\*j\_substg1.0\_0E4C0102\*CGm\_substg1.0\_0E4D0102\*n\_

substg1.0\_0E4E0102\*FHo\_\_substg1.0\_0E580102\*p\_\_substg1.0\_0E590102\*EMq\_\_substg1.0\_0F030102\*r\_\_subst g1.0\_1000001F\*JLs:(Zi%:(ZiAG~M{nHHi Marimuthu,

As per our discussion over Webex, please find herewith links to Licenses, Third Party notices and Image details for Windows 2019 LTSC image:

https://hub.docker.com/r/microsoft/windows-servercore

https://3rdpartysource.microsoft.com/

https://www.microsoft.com/en-us/legal/third-party-notices

https://github.com/microsoft/containerregistry/tree/main/legal

Have also attached image depicting parent component.

This is in reference to -

SBOM: https://corona.cisco.com/releases/331413/images/1186257

TPSC scan: https://tpscompliance.cisco.com/compliance/product-releases/product/1343902673/release/2143298352/commercial-bom

Please let know if any other details are required.

Thanks,

Aman

bLZFu\* rcpg1252Chtml11bid0 'ch set0 PVUUQW2U3FYkcu ;B7 134R`cP dL364 \*\9 < x:o="Ipn:hesL-m `so-]m e!"w /!?# d"m#@tp://U#.\$'.!/!/04/ ( m"&Gw\*`.w3.g/TR/REC-40">cAead+k -}6\_substg1.0\_10090102\*\_substg1.0\_1035001F\*KO\_substg1.0\_120B0102\* \_substg1.0\_300B0102\*NP< lna#@G at"0 t#@M\$6 W% 15 (" qPum)+ /s0tyle4//!-B-/\* F! Diti \*/ @-fne 0{95\$ ly:"C0Pb!0h"`9 n\$`pe-1:p023=06==a`}8{9:A0\$`</=310pCV>7qSG5r7 p.M!PNI, liFZ}PvFX?\*:0cmA?#z"0yB.00J.:A3",sqKrAm!P-Gg0p#nd1SxO1N|?pP#!`ngPg"0EN-US>a:GnkFs<FRHypTHO!y5c-p8@; 99A:#467886AP-08a:uP Ue>TcED17UV5pU:U!P0@1!p=KLMX%P owP>FRChpEau\]P\_@ - ;J/K?QR> R2s`c8RS?h/2K 79nSNjIndp\_K>Glo@l:r>751&55"/-/5<dyGj#@SIN"T#@KX"v{U967D"w3#@%r $w0\&;xk\} + |@G1@`#@r+{![6},pfFg4~85A < zxS@OTH&i;mu;u,5,o^pu@w?5& < w0& cm^2 + 100 cm^2$ ( 8w^/A U aG.u8avWebPFPjQDE12#P;{C 1 L"FThi2P w@00o8P" P II1 c3 !LTSC pj\/zr \[/\_o8,0 hPf&D&b.cPck'r/\$'\*Pa""etldrfw0{@HYPERL{K `ecAdP?wra+&nbT`X'a@/?3 w@!Pp" 'Mo'M??/?Oog\*b'\5 -P/w`Opl/;!Vr-O\_nO\_o@?/?O\_oI@'81RPIw0ry T\_oT? ?//?O ! ,-#?O1OO&'5)\*,0.//?@aS0@Ocx`ppZ`jj1PX!\_1P./?OI?JOK\_15689:/;?<O=\_>o?@W?BC[`r^Qn"-OPQ/R?SOT\_UoV\XYZ[\]nOoSSBOM: a!o'@33pp13/@L|d 7uvw{|}fo \_oO"LM\_P0pstpHbNpxkduG-x34390267}/2pp329183d0mqlb@xy~/?O?/?OVPqeH@kwg`4py Fr?GAaF F `quFH\_ohpks,Awn\_obOc\_doeghWij0/vSg5p/dy"74}<SA2PR11MB479332898984E7BB5EC417C8D48D2@SA2P R11MB4793.namprd11.prod.outlook.com>bLTqGo09 js

+QWY 13579;=GIKSU]'?"B@Q?\*%)-ACE2[:B/Marimuthu Malayandi

(mmalayan)\_\_substg1.0\_30140102\*\_\_substg1.0\_36770102\*IYJ\_\_substg1.0\_3FFA001F\*<\_\_substg1.0\_3FFB0102\* RT@B+//O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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MMALAYANEX/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP

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MMALAYANAman

Kothari (amakotha)Marimuthu Malayandi

 $(mmalayan)amakotha@cisco.comamakotha@cisco.commmalayan@cisco.com_substg1.0_4038001F*._substg1.0_4039001F*[_<_substg1.0_5D01001F*$_substg1.0_5D02001F*^`$_substg1.0_5D07001F*$_substg1.0_5D08001F*A$_substg1.0_5D0A001F*$_substg1.0_5D0B001F*bd$mmalayan@cisco.comamakotha@cisco.commmalayan@cisco.combZ@U>sip:amakotha@cisco.comp;I%xOM%Op;I%xOM%OXxOt_substg1.0_5D160102*_substg1.0_5FE5001F*cg,_substg1.0_65E20102*_substg1.0_65E30102*fh_substg1.0_80080048*_substg1.0_800A001F*emX_substg1.0_800C001F*h_substg1.0_800D001F*jlY(!eyJJc1VybEJlaW5nU2Nhbm5lZCI6IIIsIIVybFd yaXR1VGltZSI6IjgvMjAvMjAyNCAxMjozODoyOSBQTSIsIkFTRGlyZWN0aW9uYWxpdHkiOiIzIiwiUGhpc2hF ZHUiOiIwIiwiTXNnU2NhblN1c3BpY2lvbkxldmVsIjoiMCJ9[$ 

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"@outputVersion": "1.0",

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"English": 98.21429

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"@schemaOrgVersion": "1.93",

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"@ correlation Trail": "Extraction Id = 69770f 49-18ba-42be-94f 3-86839 da 8be1e; Entity Id = a462621e-0c 87-40d 4-b609-0240ea9d f4be",

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"@entityExtractionTrustLevel": "Unknown",

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"@schemaOrgVersion": "1.93",

"url": "https://www.microsoft.com/en-us/legal/third-party-notices",

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"@entityExtractionTrustLevel": "Unknown",

"@outputVersion": "1.0",

"@schemaOrgVersion": "1.93",

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!"#\$%&'()\*+,-

 $754c802ce6f5 = 512^{13}52796317 : recipient - 2bbb022a - 9d21 - 48d8 - 912f - fea5626843eb = 1713^{13}52796317 : recipient - 00826e84 - cdce - 4955 - 869b - 660b92e52172 = 2561^{SV} = 1.0.530.0; SN = DM4PR11MB6405; MV = 5010; CT = 8/20/2024 + 12:38:30$ 

 $PM; ODF=Inbox; IFIC=<null>; HDTR=0; HDTF=V15420240627.08\_substg1.0\_8021001F*\_substg1.0\_8022001F*]$ 

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"url/suffixText": "https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notices https://www.microsoft.com/en-us/legal/third-party-notic

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},
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"url/prefixText": "https://3rdpartysource.microsoft.com

https://3rdpartysource.microsoft.com https://

"url/suffixText": "https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal https://github.com/microsoft/containerregistry/tree/main/legal

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6aT|ytNG<;D;8+YgTuSJe%2yRfMg1I #/6U=z3@"F=x)IvDupTz)Ws@T1 lm(d# *FR.K$#p'Ju4K_WOH
Y6\z(\% RSSN \{!dOE' \{e\}FX~Z\$)
0obJ2$"^x i#On:g4b9 3e`!eG# (|(k @8\Y
vZmB?{Gpm(Jt@hr32j Q+T O+A<^U6a=8(p[2>
*1 KPF$@$PP(\%0091KLpi~x;M;4*aAFFu?`v8-*HkOfiw~Dfj#WAWWa3 ~oA0
7 +cP[79U-,# Hyfqc9Oc-k!i_O#3//f]3[o@p
4cGu!6jI MN;SC[v}GH[of]S7f3\hktG^Hol4
;L[R"?^=Q#>S_B?U = \{ov9c\}x!pU&>bD]\}1Vs\{\sim wolf\jgaq;SU[onw+Bgh5Klew]
k[gxSXGS $XqY+X+pOo{(3lp^+)Ns~:`OdPs5Sz iJ-J4\5s!)WL<wi[<v9{eIJwV
p@X\,5mu\{m0tdgI~\}nO-T
:4S7;r q
)&L4p6J^>k{14
!)f @HB p&93N;MwjGH/D@s1
`2}8B|vO
fFb3fbh)3#/$of]{2\#G/,+Wt|A n=4h P:{ 1$EQA uoN<x{O>1k8xp?\pVS8RR7vZ=AxpuwW^ipx2Ew_8Vu!#!;
Kxmu=y
11cX/#<b}L;cg?<w9U_?8#/GDTS~gy~<7xi+N$ z
qd"^h})6O?qy%[N4Bx;e\{+K5/-C! rcrd=r3[ *,? r(6?O2KU
D&Y/;(8FVx\i9u>m!1YtAv
(f}7G6mnt@F0:
lp, F
_-W% JxQ=q7 ERJ:'w[BGNcQlmscZ`Cq,3%J50#!8aq6]?X9U]7sc0-
V22846,pO>p^P}K]qM-wCkBG{NpW<p1S}xFxV /;!]v198wa5]`sgL+LX`J.y5?>CTuq^fm:6diVxt)1='e;a$>.-
NIMoi:4{yzsW`mR3}y+fd8_Y-I99/_@s3?Xu@mZJ)&e$b%F>`z
dWm\CIHBI$@G9M<L)YdP;_~O=&g;V 'T%gU(c u+,<3N}19>>>^!0LNVWm~fw1cO$Vh{@lsl:CHN8
9evfO<9!ALef9+KXuBn{O$|~GwgCa)SBB/Vff
s} Xn
```

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!L_|>za1#tmvi}ei,?OO4*2sHf[<{&~AVJJZj~>Emer/.P\,eR^N.--UhM\q@=eHH)%7]\N|>W]v-
+WUkUon]K*QnAG!XYRVU! ekyeWZN$@$)
q$@1GPpf`E*Vh9MNjUSH70U~[3u28W!7frh35(q38B!
01^8X0
Q59Qw//}hr !ft#B<Pe~Fm0!`p{-ZQPbt/ z8?iL?[15sG
)B';p~LI>fsl ,>!jVL@i}-vfo8h%nTVl?ff$xMv[)IeeG
58}k3QV,9bBT./mU+[e]b\Y9h\UJuZ k+#bZ}ZA]7@X T]YF5 FUDMFSh\B67;h, "H@<e8R fF|.G' nV'fRA2Gv*y
\langle Z, \rangle;8{B
803B;!At\ $ERZ@H8Bm>6;N<DkP|ya %V-`Yge}Fh N>3M3QcB;x|60K@T"yj9(HgH`MC\>38/f#b%O^VxXw
\sim N[q\{pGOk]G=^Lb+nA@pC^tEo,7mBxM$/(+c4Wwm <{HH})
7D%S.x@mN;1Nns;72"jjxe{5CPZyc
6UaAa4=fsbJUbYau_Jdl<P0OZ[>a_WHIQLk:Hpss}k5\F~8pT
G{W!4dBem+jeOv5uI tHH7zihNz]Z$c%;YL$t&C y,fE<e8LL=LG`}3"af1N.9"#]7Q8
 $D$XE:Id:A%$$X!n=?~|3zh+W>`@(pu;s"3U/D@^?UW][P\?>.w$eX98z
{]w<oP0s{NCosam=X &A->/A --MwH1K]@lNj=seH3sgk/`=uP+\!oGdcg3YPcJ-#A`
r \sim +8MJ \sim LzLnQK(\&G)qYRrFp7u|nI)_F !Xr\%; R`Oh\%6Vz97MDDWZ < SEkqR!uT
Ww_UOj%Z]symB@jcb9D=RZ5[.yLOVA-
UI[+mmSx-] $,8D+e \r y = \r 
m5ZTZYn.j0vy'G9dvwg#!M&Tt>LFA$@'@A @>(hDYpA8
'[z8ViY:+(AO7$N81[W7 pL1M2W._~ 3CH0k,6?`?p
u;(1::\&A?:N0 < NTv08B3 Z fbQ rcpl, f[1.B-a + X8)
m{YafB:uRNep8O8QJ0vCj@A>o=;{k[ogA(G'ncRD={Q
c]yOd?v@e)mg<6+/O vN>OmEGdQwjS7q4*fxq{fjNuvfm{U{<Kc;
rUik6E
}rBNab=r_dc0PLvlh
f{9::-"vg,*lSwZIM[3e*=2Wt:,&8fy{kz8(pf/^?snRpt
lEvdGw=E]ZN:GhLJ]x6%hEn379loY]^E*$O gZ5/mA$Xk%dn]*eY^Ju7[RJ oy3}wH$@%`r;WD
p~eLJ$<.tr7bga1cb}f"?3D]-A1BN&S8!mQ:?6mj(,]SX +C8Uy5nX0Woz*
8uvGAtr!$N^r'n6 bSM pVg}|uy0}$'
at!v3MwAXA>C/V!YVto_`.30~v="fw81+JqtY+&8U=je+P-J@u
+jEd8Gdm'K^X
kt[n3c%?2T\5ygEISv$CF|vJTy,1 Udz
2ix<Dp05"1s:e#nuAu"^$cWwL=J2,c#8dVKJG{+
VV"&~S)QsTd=jUjTKlM{a{HcV9#mwj}~&9SQ"6R*$[mVvU7m,ANWrJ[[wSh$@$@'@A
   @0 ec.A.N0%leK%Mh)N339DGx7f;0
*
`=<vPVOh
dLc)Wz
bqrtmDBb#g.lW87#Mum`6iu[gp_cwgU:9>7 fzx\}a!VXc5@63,/e3?^Pu~5 [1 I;Fw+73&9O2
fxl3d91s//;em,Usq_I.Vaf^]XcF6BU!WV:$C_W9-vYZjH`Y>gv[,;P^h(^]Y
S^Vip0olZS5NZ=h^\mY!L`tF8+dP=lB^ Y'DU$?(U*cjKPJ1tOd^0>R*T J&{Ko 6eNY
,~J?] \left. \frac{9}{9} \right\}.9hyywfla+~ Y2[%+a=+|E, @_$@$s0+s7o uLBSqX>}EcvYIKutep*8ap}X[
G>["nt-Al1F]q5a]NprG(8uLhq+<DcU/l^tB4p+&"1Sxp1`m1C=t5\fh#s,<s]+@.Ex%Sh5mUTan6]]gi=5SbR-Control (1) and (1) a
<#]x?o91i?)Mp{_47dRGwD|OwZZSR~Vpd+k,hsvdRu?;Qggspm.BlUa_V>\}YbvJAE-n+&uCeZ"~o8[Zu8o2,-
]Ib|DV(}PFN9v}
2EgCV7imPK?\fJ)r\1UUv|' @d# @~so .D6.49mkWw8^MfjuRi48Lua!Uq:'?#tur'# ;uA0=CVgeM[oY 1k1p
!p>];F:[p8eBLE= Jf@Yf[
yh3ZwDX;y<8qcJrd8.#4C;`Z Nvx5B48YB
```

EV6Yq9Zq ep[5.mt7>\*d=6\*Q<Zg\_&k[]B/y,rC,tdpF!IW;Wpm8.K.0dpaJt t#WY3s~ 2rL:E 5hD:X^yrgK2Y~m 0 dU V' X&\*p>:AUO'7|c%16 8p\$-^1j3+VHXA:-g]Cq,t=@G :axUP3V "'/XXq#nnPXmk9:s }`NKrw(ae.=3AV3C{6B}6q2bL ;%D;qA+6'X)HK9;.#U8oPa.?=kd,V;>!o:%^X%Hpc9Xw\_05J,I@[7 uAYu uj r[Cr#ZR 8g4/#enae~o.5s VaSLrFZy08[sJl?mn^urtwTZWCa@ ? @'p'(LwCqy7HCB-8k%5k?Q)x9"uK%96T7O\*UX/Nip/P ^fd]<.(VcP/j81JO]'TWA s|HFQBgnqqC''\*OnkpW|g^qqLUP7@2y<W9#\*J,?V7d\_Yd\_UV; \$rIS"eiZyi;JJOoGr:J\$cU) ^C\$[f`Xp;Wx}Ug%?2^ 8qzrRSJ7sq@ol.S\*\$@\$@PH SN9E;Z8 yn6I@p<gwH"{&\_X#W3x=p (B8(\$-;g]e\$dB Hfln5 %\$\$\${a>o=BB /-/IZm.~\*aCc>|110\*8rtu\_ u{)|\*)fV,dg^&;UW%z9umEzD"`L<\FUpuzvcliX"\*e(Tb\;zv\_wuUF>L:kvstrqg79\*;FzahvGSIir5h+P6gH;\$[YG~\7W ^JCCoQ\$r{pWybdjQjeEK4m@psH1TI,vmzA)[Qp6 A ~q1xV% J\*Iztyt+.0i ?Z`c)A^iiiDooowxGJAPp@9# B}}i;a{pc5/#XK/lQA(Es!E H#fY<qNZ@p mL\*Z@o-X Q"wkYaR:B[GZUJY\*v|I99`GX45;M`\*`y9 #5\*Wp]"\_<]ULc)mq!C ?9FAK^=>U%Kt//1WF}Xt5i+Wt~6 @r>8UIH ,~ m2\$8\*8lxX \$cx&aigiVmjjRt TWv#>sf6AiYMG.=.\$B~7C\$ L]vVp)))sYIM}O2E6G G-`\_!|}gTnZB2l!Q+xomN<Z|'C^\*\_'}\*/]PafYNisvY+'uW!6|Yva]S u#i03;RfztyAGKNKSx"v}XBf[P/XruY=g?jWU7/3PR.1QK | @xwk @L=@IDAT^fNHep06kL~ ;d\*iIGp~vyZ?0+QFr+>83 XY8.SN2vX|K,\*4`@!CX/\$qE\z8MA@\z WPpmG+rDb>c\<wku Vt+a5[1hG`y'|AW`RxhB>?xq{=Vw[^1X4HUcnCx5B'haDNA19guo <XN:va<.boUcg6h{eaLis\,!y{d;KrmLyKyIh}\~~\_n,g|N!LI'eRikv5LPB21;?'\*HnmVwj~ i[]VU+/U}? g/6MH Y]&VVI/M'kC^%Uy;=6p]>kbM]k-8U6n,;w(7\=0h-2i@3'4 P (L/^,pzOquUVYdppk% B PH9nsAnAi\$=4+0h>1D\$SFhP pOuST) !9{]y|,o#l[x!:A0J&17ZG;Va<+r"5z;w+P)AQuo&GRQa`i6d%\*x:1ty\xU\$CT.M;w#fy n +'2tm3Jifx>N\_s\$yt] 7>IgyiJx< K? \*D!+2v|t6ER: [O/{d) 7\:\_5+#Kf1mSQ,VlQ!f--|%D4;RoAHpy9VYtx:EK!'dVTBnh\_"[H`u=mMqr%YUROh6d KR9HH"#@A 2n<H 'Mr~:G>`6% 2ipd"Lna,C<;hpye-[466%KUYz\_~ep Rj a" T lEr~D| ^wy|G!D8rkHZY rSHw}goqpB !s(Z`wBuj +^ziZ)YEA +r"]|"&%{i~C[~(:\SAn}zsAtQp"lNVY\*pBCKfTc\*Qp//M1#?z]qXOT'gHA9|)<R@ ?NM?KJ{6HJFK"`TQBV.XU\_Yc5(n;9=3xS?Hw<PR v`S \$'6\_vyGEVZMWF~yV~ f[I1]!cO~&D.'?xOS5+@mZ I[y2 rsm iC# #f/uA]IuO# 6g2!LH^D6x^xn8RC)t>t(9cP{Wt M} `FI/]h8d `rC9yR"y]ko-[6L@hAKr`\$}v:EZ!L/o]}w1R/bb\_8N:C c0 YwJ5sO;3UN|J '{=r>aV\_urSs %`8\*\

### W,mHJ

```
sJH K[CR$5
^7U5oIJ*u=]VJZl1:YnXN/NJYbUc~]{*Kqd)&y'6fOJY5ZLd[KciU.5dhmbj9%]{ujWKH$ d?a
XL$@{mBlx!E#Lj_lg9=+!Q,oF? O8Q[XKTX&CP}o/v.s"<:Pu~J+
O$.B"EmGyT?6p{uB=9-[9I'L`#i|=Fa"W~Dkva;/A
Dm1*AWZ^bLS9Vm!Xw
$zq1VIeG'q!|BNIaNOww%V(H]%`z(S&Z/M@d@H!+SxzzxxuBmyPUGE@r`Tp|cv=$0 %CZ`n7>b|@$ t}zxS
*]j^91EIU9BLu3g |fQW>rwhZqn,kv|C8!TU F$@$?i @Agv~(<f:}S1{4{$s>|xP,wn[nq~O9
:3wE> eX503?/gQ]}\nWX2E39@?+<y6}>$Eo[za!
`u]q_Du{: A0 J\wubokXW/i2q]aLg!*+|}eb9^{b^+hv["8,Y9Qk8y/-@}FSH4<^bG2~`&~b{,|.u~kns|RJ9D)-[e;F
^xyv~_*;\rCd7j1x+K;]%sC[GUB1 +& p /pG$@$e]Z-/
euc9&T~@8DB:p1uIL1wmbc2}-8oVyp]v%UPAN=T9affw?2:/o%D%?G6;~"27x/ C{ 6G>\yQqh
A@6[yP|Bx*Yt=<Mp@='oUL.+w}*\sim d*y]g+E#*\y+Q#^vk7l \sim=G[6c'?]
5~uE 8CYQn,qn3g]tfb}cQP;^,_=c e81LcL+g;;?j1<m<8
!P49Ss9JRjGh DH0Yq8p]b! m:7 M/_j9\?L-W!\pNgOIOO},36[6.%&nqO"Q{ {#_FFr.xLMTy=s5v{rq!Kq@ugx
L)+Lz{Gsj23 >Z;[qmXyYBe{\$@E}gY1rCOy^ m7_SPdMD\# =\%coH D@(
z ygAakyK7Lh;X:$Z83+]UTf0c.Ix8nvgQm\+2fvI+GD}(s~@cWe
$paUzy 78?~>XkWc0`&n' Lp ,))ZkjbvUJZZ y,{\h/8qFRsU1LDb?q6} )VqK$A
pGPL88Ge"9'^+6ch)w3~];X s+g[YcvH&mjw:${X#(0#THK^ gs\gF|7*NvM$@$;\!;~<H
r.ZUpUT;vt9Zb!19PGA3^~C>14>*3fp.Ua:z)>jNf
fu~
Gu%u(+`bZ 8%`\:"q|%T/13g"S
,An?+G?c
URx<o;wn9XPNi]jwK:D 4s:U:w5-7]wXH1yRhcKk{(WJ.9j& y:bd %Jh6fC~goHq'f#|n
v8v + b5jlO>z /
!b[Oa$q
cimc=T8PZ{U+
Y/
0%uKG-*#F'w5(xfx+M DJWn2ewBhWtUa @/@^zc<;<Hc{5TkF!J9R|Vg
mf'}|wY,v|<ap3B@ASZ?!
! ~?
#8VBX@[B`O?<
33u'| yQ#86" ruWa)cxH|?Z<>'C8=sdpd)r'&;&'OTh2s}
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EIHrG*C#?>;bB_~p2fK#/j0JFrN`kc^06lu">&M6c[nP}.H,|lUV!8a0:99nu]g9u,U7$7[N+B
+r2@Bf.wSP~*QpGpp\Y\Fp3o^a+uU,>#+yv4V\1|\P\ 0\8.dYW\K2sf"H (d{/EuS^w})
P"7k+e$j(%SRG;]]#++?;6h`8eR$-4E*mT0a$ oHp"a/a7n~#1Nw8,Z(w]>F[$ll|onJS4~GN
cxa%HN;m&g!5B:
9~ZJ
/$Ge?AnXIG<!Z)2
^5(D`nX Eb(3<@e$@$@$@$@$@$@$@$@$p(S"
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                                      ?(:$@$@$@$@$@$@$@$@$@$PP('
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   M@hFA$P
1CV*US^jT^]j%mq$$@$@$@$@$@$@$@$PP(d%[n*.Nk&k-
ZHuXH$@$@$@$@$@$@$@UXH{[NrI9CjQq$@$@$@$@$@$@$P8 P(&c+W#Fq/l>oF-[f0
7$@$fGb1/b&N%J<q|)M~$6?u;
EU9B#%Kgu=Xu?o@?Sg}(@^ mUV$3eKs0e9RJ(7={t222'K2e$!!A6m*zG>kN3:1j3fSNxE[7]Ke|Pvm]'Nd"
mQFgOc2iy')))V&/}z+VVO>4lN>d0`3>
@W7xCpp<\=4kQ:ukg|RuSSSs~Z K/MGRF
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9j*)VX:>-(*
0bC
mqF]l?2i$;w.>SO=%wqGP9
&w)9%4AmKN?t3gN>.7xcSN(vD/\~mnk.q/,7tq6{UNu:F;{vdYAQ/F:CcPKe{6HQsL:}tq+_`8
"%\bgbY%ew{,'{
6>8
usx-.#
       "P HHL|{W }t~%`5k3sL1;<\<xNUrK1 YCEoZ]we9J!tV8r'<"O>}
g:tampVC tx/#
fIY3fnu
4vXkE^{};Pxqn+NW^{1}-H.92+nkA
!L=Z h([t5>a7 `@_,X UFXmip
3!8@BuYA-N8N3.'4?!$@$@$@$@$@$@$@T8 KH
8
s6;dbG7Bg'00!a<m[[N^8868:1N][wqV[pb'-08C6j9bGiYjF8 8Nb'7BAXaf7b%M4^@~^JmBI#B T "*bA(bu(
{P7/r}//=m{9g4h,J[PB{<n"YfZ08 Y)wj7%UpP*0$ha0${uFPJZG}$|=am\0e0F*1w^8p
%=$&&FG(~<3xL]XANE@9h!RJ^-r
   g!{IC
jktxeQtKra7c.qGeUAcmmr 1X;~:E.X2e p!4nkVK!o
HuNYxf@fvfACFNEQ<D0b6!P{+p}S@F`P Vc)%<OR&Yd@y3p<44T0!0X"!f@03`A#.'3.0V(K_|0IHHHHHH,h*
GVeRm$)1Po}FXwd[qR=A 4'E9p=9R/A>80!,#r
xBp3us43 `(M('E7@JK/+l[(m! `dr #f[A0Xe:916eM'sK_A#1g`Xl#uGwax'rJxkWNom8}$@$@$@$@$@$@$p>pi+5
T[.?x# r
O~" @!3JN2U%r {AeS3d
[lq
j%*$/un^[|r-x:)0#g@B,z3zjor091;
y|0D0(C=$2x%p`<`T1M; rB6g11# bXz={CrO$@$@$@$@$@$@;g
H"`t7!;xAC~u7m'.\B!.#Hjnfqia-dHBPRJX(! 2&poW^@x#xcfr@o&\(_[n':Q5IA0*_fS0nV#NCY_+WsNK]Haa9
8 p~ 1BH
fxC:F8(6b_lLizmqS~GInW9 LvRCJ^xAL p':b P~#|`o~>%3fn-ku_aqeJfcpA8?$uM[NsZZPFNe!f&X
83
GcX&{`($@$@$@$@$@$@$@
#Jg1q W%\$
@;J?f#W7aW"QF^BP9@R^sa &*`yg$0@[o0C-?)k_
g_hmf8mBL|E(F [0]00v
V~!zCNc06
HQ)$@$@$@$@$@$@$@'Ag3IF24a6N
YSP1e?K(IM"o)0YFw
```

Iux^'XaM4I0b&\*6e^2fGz6Ei=5=aLD^F0[\$ aj^!F|LX6I|a1!\*<yqtE9g,\$@\$@\$@\$@\$@\$@\$@\$@A F,A\$pu/ N(Z > b)[Kie]pB8::ZL|??6l mu'1,hB4i>xkyuky/Em{O>qk}unAofb8BM`2o{]GSC~m{R| y!!0 48sM6PI81dP9,@{Nkxq \%8w@A E5P veyk3gbC}-P>kD/oO? o<LG<G!}7n[;#>@71"  $x?(-3\&B8YF wsX9-(olkfU[ZEt'8"dh0 L F={o}))$ GKMkf<c360|;1 ,kN{=]\$6^^uNh1bf\$HHHHHHH/2 sUQe%2M!9RaAP"&;>tPeqC I/b#?F wU0b}5E|rCa`FA}R|fFmV?G87|WP%Bh4PZ\$p`dgB8%/Xg"O?TI}Fbf\$xA1a@"n;/G{.>^p~E~WO\$EhzJ?HCNII6= dnrHHHHHHB JLr~EV`/W\_s='&y.\$/7,[%,<r<3^5aDJ\*>=+JW\_}Utn7U0+PC-S7!T0]]?yRS%-~0G(P Wp>QXZJ }q0:!)`5>mm&Sq!00b]HfPHHHHHHH|P5.RIrf2N-z{Ix w;=3Ycd\$rY6B\*IhQZQj/@<x(0sN9pG%Q>:wFFitE~o[6<x7#:!%!{xpi}a(@H+Dl`6I]"R `+rHH\$jQ w|Axke!<O[\*@%|4lP)IA| TH4T" s?aHHHHHHHQcPJp8)BPY]"\$ { @ \$aUjDdf ORHT #0SY4m)fX?JXDI\$@\$@\$@\$@\$@\$@\$P1 A @)jL %)I9zU0TDb\$ {\`!aun\*^}J}\$<Th(\$@\$@\$@\$@\$@\$@\$@\$@KTB #gJ\*Oc@Pd!l@@v,>uJA%-J2dgHLW3'0Ac@@:vd.)X;+SN0 0J `ZHHHHHHHHHHHL8IW( @IA^ (Gh(G71! "@@Ie\$@\$@\$@\$@\$@\$@\$@\$@\$PPnB\$@\$@\$@\$@\$@\$@\$@\$@\$@\$@%@%E \*}V\$+}`R~quYZ: {"A>m`\$@\$@\$@\$@\$@\$@\$@\$@\$P^ ArFefvyq~+X+HW6ddr6;VN:@eW6(e-=eHHHHHHHHH@!HJNII \*I@ `oPC}zMOV%P "M6I (J -Ofcx<rC FW`poB ~k`G`53 ,V#HpHHH4 7@q({OCYrPRN P\t @Y`IHHHHHHHHH 3GpNb9!0Ac@v2g8a\*}!&g+\*^SAY0 R"@@)f3\$@\$@\$@\$@\$@\$@Ft\*@IDAT\$@\$@\$@\$@\$Ph(KIHHHHHHHHHHHH PJ %>& (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eIIHHHHHHHHH PJ @YA.m %>& R"@@)f3\$@\$@\$@\$@\$@\$@\$@\$@\$Ph(KIHHHHHHHHHHH @YA.m (%4h6C\$@\$@\$@\$@\$@\$@\$@\$@\$@eI,g\$@\$@\$PK]2%"4PMHHHHHH Dba (j%z"&3S{+eGOC7~=e`#%~\*[ tI:uJU N -LR/ w7Q @&@@?F!?SJ;+M}'ZS\$wL.Y7]'OI ;CF.?fhUk{+%&Kzk(A2%HF- XUke\_ri##I4S~]/Z<% "<gy,0}\Yr8yR ThYoM\* @YA'(29t[N{;?P)J[65-[)} $2 < x ~ Zk \$ NW\*Kt'Ks0w3xI:%++; `gITYnfM)zs :"}9y2{whLf,ZV O@o7x%5A! D Vk!@\*Udn  $PZ;vL6o,|[>#=[r+VwY]g_]|(ZtlJc/P[-ChR?XFXPb0>{+1$ pIt\_s !NVTZj?s.3= O#^qNWS~T# eq& @ADr \$,}qlN:-[1c;%:#w(=[6GD[x'pZq>qIxa7HAxWcdU%\*R@wB\$@\$@\$@\$@\$@\$@\$&\$c!I( <uCiii0P k\_ {ymJN6MCaoC!Ct;k/gb6\*2'B)6lR)+jdtV({Az(c\-fz>j=TuBNU0Eamq\?[fI^iK {b} (vkvyo!}^8qhROC2n8aJ?Oy,]&vVP2@\_SdTT<jvl.NVWE.0W<Ki8H\$}\$k"^K\*+CUVnKOgU[2=hV/Dz 7TkReOo-U~ |ie^^;%SJ'RN"#&uV~^"|J2-3NPMw:\*'%bHy\$t)okG+YsUrkdr Mur|"[d2;/:^/M;du{!9|\$A\*U

```
hy};+dX,P?:H7z-jzB?W(s/+WukWV?F*hs@KqZUuN.^ia{OY%9?fS_y569f#@?v
```

```
v(u.YllO$z2Sx;VLN>P85K/51>FOH/}z&Xc,Hm=<*tRSrMg!>>rAVr'JyYYd1IW
```

 $Vu{IF3\sim Ucx}z^MY>@>gc7>6Z-RL}oP!/Hc[v{]&$ 

(^4/OF\$P\RR.]>+ygedYzo6^BxRhuRJ\$~F'EP-\*HzC2"SiiI2WQdRJJUINa1

]m#\*U\*>Z(N<~BQ.:7I?~B@Ocs 6vg[.}yN~x#6/8fNt|>1FS

```
\label{eq:linear} Jip;x\]\a\sim Q,2U\%vra7G!2<~qj^vv\{([\Q_ks\&uxhlC>W>XKF 96\[2QrrlSV,wHPpeA\]@B?^,_Q9K)+]VA@pNxR^~c\]q(w?Ir+_r/~"*'N\&)U]p~Uca9Q\}|<\{29[ezcpBavYKz k6I+7HHHHHt8UJaB\]@I`;&:
```

u7EIFd2ydGHa89,\$@v

90 I&<W\_y2H:PbL3wy3xC^D+U

```
\label{eq:kPRne[q.c@!rMJrX)Q&rkGk(/mN6\]m''K6iEk/}y\v5B=^6Q>2.rR P:U LQv*2\#uyX<)cv)n2`Dq5[d5aTdu4k8PM|zt OSf;<C+H7o-S\% womh\[yVJe`Xn12ro2kB''5cVa]\},YF)<,vntU+'
```

 $\label{eq:alpha} $$ q@_i.SUy[?ic]7|JAzP=||<[iHWzE~BW(ZjQlCyt/U[yfM!.4NJp2)] $$$ 

\_PQ^v

 $9<\!\!>@aV<\!\!0M;mh\&|Iy@A^2/YN-J\{\9^@_dVYU60\%-5:eO)!Q$ 

```
\label{eq:constraint} xw=ZOHHiBV; \\ 6n6ydui&iGNoKq2O\?~2KL<C.(SSjeL_;f]zss7"/>RddCQ[[cM9:(c{H%eTS!Z=_=.{fH}7sS=HuO{U]#of.:#Os_|BvxKIr AxKPWF}] \\
```

 $>)`\$.*PQ2:DWHzNJ0\{R\_FiD.urRFvHduS5|E/$ 

`6e.O^=:qk

<PFV@

:f8wfe]2zfP6??0b

P[

O3@WN>\*t(&(\*=wT<`s]C!w

```
a:rZyV3 < B3 = pPe(mBySn`*$YRB7?N|:U?Z^{c=05*r}SS{7B77-pi+T+0Rzv@`:v#]&'<Q-Ey:4k} \\ (2)
```

djNE<zJ0`F

[Uiy

<\_&

a8OuXV`nz]0.,||3CD

 $>*J$@$@$@$@$P\%' p=zSjc_,$F0K*;v:tPTXv+I.J $&0g( oJz@Ss2T~'ItlJ2Z<2`-{EJ+PWUBZ1nc]#fkXblm1PGU YWs-ucBUayU0x}b!F,^m\uo^{U1Z2U!:On]]Q GdHE}PZ#Od`uG((!69u<ho7Q8(wi`/_U(m'{Wu-Ve}V)9rb! v+`A{o!k*OPDG|>z}S Ka$!'>fk~7KxXT.4lPQ:G(PBG0nj0e`~m=WN2P?S# (Ay+X5 $8p+I7o))$ 

x<h df`<xl(]AjdWra oI&<Oe73ty#Oh61oR3-

 $GHWx0?.E9tk6\{xn[|1tAf2U>U,oNS.][4kv;=L^FGhU[bc9N5m\&$x*b0;x\{Ktg#k==\$8G)3i1u(e)B9Iznxi':.\$FtlcV,r~y? ^v 9mt(b\&/ga5tP{'i\{w)O(<!!vsNUKe,E'<74<8d&IFHpBfo] Kd?'#NDj*rq=;:PKzOf m<ru9)GxB\$@\$@\$@\$@\$@\$P^nlH@(^Z$ 

&~-[T]nvYtiA&W\!y9=\*/=BtR'6cUum5TXc\%fwy(\_7WJGaWVeLye @3.v#\_[Y=r12zU-F7mUV\_bctRD\*

```
G]1Mx#ERnT,YV.tJ~XKjj+Qy'ty(dTnr;zY'N&f7}wc \0
```

[])(f;:f2UU7r?XR1\_VCn'Td\*xOxB1~%0OGcDRd< 8\$16-O8gx~I]NaHLC!

```
\label{eq:constraint} $$(76B\&@&O\gIT\$y_h{1y9z\QrX[#I&<Py\*maeRCbTd=^1|ILIi0wzA2xyC\%uYT1,I]o=S>G]LrC_swX6]^Sp]'O${v R=Uo@?Bv^qQ+eam'WWRrsH]RMyD8G'<Bv:\%}
```

D&07]

iQy\$X>co

 $S x 2xX f < [5yri2{Y>MdyaduB Wb8BU2y}$ 

```
\label{eq:linear} \begin{split} & 6 \} (/KhfSRb,?Nz/'v) \#r!f?bF\&ic8tl2uz\} A & OX9\&wIjg(0@6nYP''c@joFVLJ.%wqr*jA \# [d5Vm \{+7/&O4SI \{-0'\5(SS,Vrs~Y3 \ \ \#@@fK \ @@tt6 \ (z(!lk7C_"eA);2d2!_3CX-k>/qA`s \{g*sscZ\} + \# o\&/g!L(3JMW = 19y5) \} \end{split}
```

b4ytW0rkB`ZN<)P?\$[>tnQ\*-S]';R#BB/1U

f

dYHN s;De-DFFHrrXg/Si\_]x.U((#fB 1hVc&?K3o6SSF

 $BV\ Px0eh/e\{wy5B \$@\$@\$@\$@\$Pz)=lH\ [u/Zv\%4win\ dYHQUrKRdnNt\_.=n-SE \sim <16Q\{u\backslash M; 3Mf.show t_{a})=lH\ [u/Zv\%4win\ dYHQUrKRdnNt_{a})=lH\ [u/Zv\%4$ 

\*HNSL=7u8%iT3X%wum{]2d^zzze8 Vt &7PDS+[1xPCbscc;.&`7nPGe1+".

:mP!b[zDLUgerJ\$ddV\_?\_s.Q5u@eG\_s@>Z&<-<qjo

\$k0D%S9JA;k6ly%u]\KWvy2Y`\*w<O9+;;{& (a40`VO\$Pzue)rUWo;sg5j!l\$-

 $nSC+="fJ(Q(@)hXIR39I>Nn)#c0_H<SOKr?[pCQQN^<{GkI.\%_/f^*T}Dx~(2_ts]c2kKjvP@BUc1{?L&\#GS{g}'5 Mid8M~Zu/s}]$ 

P|)W,g{ch/dJ

7s`.w^I4]CT I]{yK)>\_z3e0',[AA,/UkISgt\eTnXK \_#v@y

c|)U[]]"]7ca]^Ei]f9cRop\_g1`Kho{Ms'%)#{#\$[#!O}Nq}Y8q[5o16one<6PyC>{mR 0~!V}\$@\$@\$@\$@H WQ) ( IIIysUwQKSl=K/k[ozX\RYS

 $C@B!o|$o+zm?Q9C.&SQ_>i@U.(S~Y*I k,9BTw$+c{2'pxGWc0V3^?Zw\'iO` #o{-Y38*t%X@8iV_oyQ1T1?j}$ 

```
\label{eq:main_star} $$ MY*W3 m5F.epko?V<(|_MG<g^?a_('xD%gSeN_|/)j @ U%iSXVMd:_{]+mxxQmCem R%q1n@ #oW}FRJXBi5ko}Y)?4M3|Ux0@0Ka}*\qPXH.W&ZN)NQ(cVht3`A]>kD!*AqLz'(1(u1*F=-0)) = 0.2 FWL to a star of a star o
```

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Ζ
```

 $b @ P\M62p @ 8q, [L4iz(On] >>^.rrw$ 

 $([P/BJy8k9g>aJ]X/g&jlTa`[Dd%rR"/pb3oa&_.0L6c+?q[5I\(,>J^*n9Co^<7G)HK+cFINm1n*c;EE)/l-jFA(|~vu*cP^9T%X<dWB4JtkY(L|n{iwR}xky;zi7Jz8h@=B.$ 

+=

h:J+^\$>yc

```
fqo^n:@Toc V5"iw}Pwp{ymlm<a0S*3bFU.pwB{vmuy]F~V1[<;Lui;/h>P=!x0VhM R
<~\n{%SYtYy(]v$dHilU@ X[*U^~P-$;9mf$"$z{ uVUfg3K]ZF-ovlu8S+{dD3$\yU
```

J#\_PO+C<DK d,jE]U"SHAgK5`

 $7\_uq8b^2\_)hRBp@\_5Pr8yR++GBfs.PBrT]gjvDB!4U37?c\#820j`?z2\${T5DWSIV5eH8cU!asaD1xe2-interval and interval and i$ 

 $X.=fxFNT1]6! \quad (***AO\$P9rDNkJ\cvI]$ 

uhR>U))^AiPR

aPWn^n@\_#.PU@qY/Sa3^

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G"
|
```

```
#.)\GI~VSmOiHIZ)O7Jn;w5)3O,C$@$@$@$P04K -[={;RdtX>l,0vH\87GCK`HC hK Tp,W3WO(TV\'80:-?JN[Z
```

\$zj-r&}

)\$HHHH\*\* #d-

&v{+\$@\$@\$P

ru3a)k>\_32

```
n\! K{oye$@$@$@$@$@$@$@$@$@$@&@WHHHHHHHHHHA[^ F
hWF$@$@$@$@$@$@$@$@$@$@$@h4QpHHHHHHHHHH
```

```
n\! K{oye$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHA[^ F
```

```
hWF$@$@$@$@$@$@$@$@n4QpHHHHHHHHHH*.*
```

```
n\! K{oye$@$@$@$@$@$@$@$@$@$@WHHHHHHHHHHHA[^ F
```

```
hWF \ensuremath{\$} @ \ensuremath{\$} @
```

```
g?WJ$@% @hecGQ\|r[o:$CHS
QrY}P\UyI}ofi$sxy')~^ILL}^e=%)Gg0**SrIIIv\oY\ol
]5@%0m4Yf?#|[J^dCBB$..Nbbb<0^*'Ov|_0.Qu?2]b][gyg_?_+-FJi3g\~RzuLzIZ_|Q0Rtx_? ^
,:o)Eo5sfxvq\kaEp x#Ap? @'*.t?}x1cd `{O ;CJV<?_]+h?C>wVSUZUM['f^x~(2L$B-`lb&8
vcq`riC~JIqxW0kXk|w=zykZ7ow7f !d1m>H~m,4H/_gA`:+"P-5W0!_|EWL$@$@A_R,G$P
M>}e6anq<DxC*2pBDg6uy7
> \Gamma xwurK
O?y1cA`
rI]^OIr7"% ]n3@ H-\landq{w{<ep2QFi?i:
u71ojKk{f_Ef,,JpnQEis[ogYl_(Hq|o`Y_vqs(\Z mQHHH|&@|y$@^ ;VFDDHuXDbQ$Elk)P#Dx:\
B\wqr^W P!6>GeJqXHk:$r:mI|A#Pw-b7mTnUN8!Fy>32VZe&$f `\Y ~}?0c-
,,L}Fh#_E`WZ5=aqN8sNa=w<";w:kWAl~'u{NFA0LO?/w!/5k&p,xb=ICCC(=cSGs7FkFy'U|bc\{%@IDAT
WRE_0>-+~%Ku:uQdB0_bf9}g\int f^2V)7'(b6
xQ9an&Abf91V-?~ mcD$L>=
Ba!.;d76o>
qABx5kx[>|>w1ou ^z\%w0:1$w
x ;^;^Ai=cvx"Q&M4mi/o3p=0GEEQBb}!t%)x>|!]5Fd7Lae_]Wy
uA~7rI$@$@+WLy$@$`#
?E N%(d
cx:AI(C(Ji$
^{Y}{9(>PKq*CJ|+,}
Ho #K9rd=@y{`W[Qu(`8B.ka
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yk(+\sim@:F-goG||)M][IJv<u3yd\%m7o=\}'s x6*0#>(qc<0kJQqbYlA[u\Y=bL?aPV[
>f
B/(k+U>)^{\}
}?~|P^'V#Z2E\~7a_a8!:BFy6Ff=:){||q_1`'NY1{x?5%3r`,[=b
c]Pk0q2q
;vACm|F]gG#g
Z{
WSw9ei>cv0w~/w%N<%KbKAwO<sz{Eci<XuMwfO$@$@/_r g(?~<'-$2q}X!OE;0@[0#CM?\ m?1O:2!l6Q
fD^PO(Cu+(?(i/5
xr-ZAo3aG4KV1.2ahfd8)LF(r!ZEJ:c?g9PqPF?GPf@a/zlCzCrfX1Me2
YA1
}2m
9 g7y;![(WBcpk~(1<M=P"xcL'{{g
Foc<oz.6u}ZG'v%MQ[kyx?c7}imOe;Jqpg_
xw53%$]wVz[@/C;.(q Of(1[cJt|aVv-
1^{0.4I8} \le (fhkW\% fEx?0gF0sw z|b{xWc;a&0rcM/&z)gg=0[_1/S1^{(<"3];8d~g}g]
.8 Ttm|{Neet!).&Y]T
CsPi$5Luld&?nOR%"$z{ uVT/oA?GUP1?:8X^8P>=
e1
(_(@`%)B)6b*PC&Zj-
!/})pNh0P^@aW*(\p?i#+W<oW~cXZi}(2.PByk'B@EBm@I1(Q\g!UUoxCa
sE=@#=N;Id&@@R~J(1J~(\rF-(Q@/~(/
```

79#p@PFZg5>@1c%<gx/oN^/%wPA}|(<9LG~w2zmwKx8 OP#4Vq

 $e(@) \# Cz \{0H \# FYBW ) mgn \{ \{ [ \}i \} j9C - k@ cup \# x?; \&A!r$ 

0p@j(P

 $J \} o (8 alDxmzX + \sim, \ \ \ )0J.\#NNEXwxW@ilfL>AxFeFL3zfU8_x;>A$ 

 $(!xaZJgB|wx}rJxX\#)ZF|.K~_[}gN3J^S1<\!kV;\!>\!sE} \\ = 3w]a~Sw[I~1HHW!py^7 \#(3x(E2FS)Yg8-1))] \\ = 3w[I~1HHW!py^7 \#(3x(E2FS)Yg8-1)] \\ = 3w[I~1HHW!p$ 

 $p_1JiQFA!3\&[W,8ve8ycY"4kX(Qo<7:F;15Jk8s\%NJJ>N`D\ FocvcCyf2qg\}$ 

f@CYf>Ag80qcsj78c

ic JP@1|P[Rr^Nbf+3kYcMQ5T

vwNGBe t=zj=mYKg).n.N|PJ\_3.{c4\${<O/N}

 $e5o[0R\9\#n10X3`Wf=u(!0*0~gn@Y9oFFb0AH>P([J0@^{|}P`0R81k`N])my.^{(6>*w;n} DnZI\%`]$ 

 $\{\{S(y1)\}$ 

azbW:5Lzf&[IcW.Lc`j/? 1e^9VKj0kx%9:

2)}5c97cOv%\$F0Xcy>

 $+ \# PAkvD3M!7bX0\&`@A3P?\$|Lrs4, 8Zg@djNSyw!nQcfMqnu}_KoT|]ve-JxO-baseline=0.5\label{eq:starses} \\$ 

 $lyW:'j(*b'XdD90f1*0e$x,M9.~<NbSKw_i=c\ANoe?~g@o\8-fvx>1E}v$ 

 $ac\_S2Fm"{<}aT"^&\#{<}m{=}{>}sL \ (q,3GlGGOqgCj(5OnC2J \ 1\&')x?wfFB[$ 

 $\label{eq:solution} OuOn8UYDN3xS=7c\%,/,YxbxW{i7YsuqzPz{.k[gYXPF<BH.8gg`s>g^_wB!Bd\rSb1.144ac\$FrKZf"DDER?>9>z N{}}[{6Qmu}^fr'|vm&m|f?C}f>}&#@KE@@`\IAj1[GOtfe~Wu]k']_:c?N3;#V36h<~G~F'EJ:`S5<se:Si,6yT{q0swJ}F3'i\$y_FE)I3sN9k"I! BrDg.:tS.KIcrA&3~?/3u$i]y?&(BFJy:#-kj:*37Grivh>OQqqKn^?e4{MgBtg=U]|N`I94/2WPJ, M:mgg7.is[X;\z9rFYu|-yzMRCr`hQtwju?fZt]uy:D2ylu{ |GeZlU;)j}$ 

 $\#3 \sim \& HARVSLa\_C8ulW3 = \{1k@ wmJLurn2Gr'\_t| 4HfbO'i\%.k \\ \& A.2 > h|? \\ Jzv'\_v\&u > O7\& EM\_Q3 \\ \& A.2 > h|? \\ A.2 > h|?$ 

T:uYIgkO&=\_MPg>/c'A|gooRI`5s}Ofy]7

n;IHjsWE;?:m~sM\zEcWwFc>c?\_9|^|uUsu~RGq\*D=15N.\']KF'B=A5mAWM'kMH

L[uX

 $\label{eq:shear_spin} $M@ 3!kM&96u^LE} = atgBHkcM:GNCV^:9{1t_qsb6}Z < c8w;%sD:tw,)jm{zr\z(xwOYB&_R;p7Mwf\V)?dTJu_21pLH (iwd>c<'o:)wy%HJfm?]o!j}y$@d$ 

s'@jN\*Upk+D^C=)@

 $fXIdFQc)gR2;SG\YR^{0}P=F1jQ]Yz]?qUN\&8ltD2\#6t\&MHV>CM5\\P:zrMGKgu\$s1Mg{J;r3}\U]w?P2)em?wH;\#v])c/r*DNF:wP`jSOG|l(2)o)wtjZ*yP.X]s;a24O|y.$ 

 $5WY{:}N{<\!\!<}gZTlM2mq\backslash$ 

 $?=7<5i{\sim}><O@-X@@|:s3S+MZ\backslash dv]>c:\%5\$shNO:d'XGyC5\#aYQ9t>/O!kgvgl:P;JgtRKdDhaRv_>u]$ 

rmo\>I6l[;brt3

s2^zsg

 $I(u$bY\&}s*yc9Nn^&ze?#Xo^B(\mbox{ms.<Iv,cm}#KNw\%}!ySJI\&m+xM^B?!ki;'\sim vMMO6yvm,N'H$D3yfx_?s=; 9_FN(_SVUG}tsgLu!w')*sR({o}:,!Y'NZ/|f{/~qz/wWm}]3P[;`\o(:iK)wr7wqM|Wk{R4wZ$`S};G4g,K1y~L>w&:3Izw}$ 

oPFCs'F[~n=4%w%eiG>]joA~c+tvN|vd]E)ygC%]d[Zr>m>D @`1

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tw]:dsi8W\1\_|g9V9W`R ::.{+m8g/2xqfN3} xdJbJ<1M`N @ @V]@@`w^7((ML O~d=P[h)M oxCy; os#,lAs<dM?C9/yy> @ @,`yim}3&E`L5nunn+9zU.'A;d~x'=<o); @ @Ysv[ gYs2lZM&kj3j<yw&zV{` 7lml&UVH}c+M6|`Y%kG?Z<rFmQKVv6xJ:O;|SCp !yH9S[1 @ @ t\*UM7;ynvR[oc)\_W),orOY3; LxdfV[cLTs=oZ^u]oo}>3N:/iGqDy~fmPdN2iB @ 0;^k5 ?%w|3);v+0{ ii=f4 7.|+[I t9T%6 IZ?^sWM<qDi /@@:0@sw{Zt4Z.h/zY6oBi::x/46.#8Xxoh5wnu.\bE3^]Fm-(@ @s[{.w)[mz,mL:Cwi:J,G=jhS& ,La%am{KYAJ}N6}&u,OC?4Uw\r-O>> @ @k38y:?^[gLK:LLLTj\sJrA{ mx^VnY7'Eewn6|^Q!?tfy=>?G>CL?C+ @ @`F3bZgyDYQU7a,nT0/|/<o  $6O.e < r' < Zw < (j)7y5epqgy Gy^T_+NwZ1>sLwh+muh < n~mz9v[i|m[jLyX=$ @ @M@@`nnVI{c=v)Wzs\*zlS \$Mmnsrc&=S,||OKFN+iw[`~Z7q7/|yX9I'4lpeo=[~T|y?% 'PJ@fN~6t}'}uuOovaYgU<o[|4d29tvn--[GY<zGn= @ @@ vYE:\\sUCxFySZ2`zky;YvmHtT/3wu&Ib:o6myTZ+u9&6)9udCh\_\X9\_3|&'w'okL7)@%\2%IQR=rm2yt:k^)u8;  $wN;mr \sim [mxp+g]^W63nt[2:U|nIvr-g[tnMys' < S>\% @$ @^gJN[l\46,nm:FNzRbwko]2qnFOw9:>:>]Y|yIt(&\_yrn>mn55H{hsFOg6`M6i.hF\$\*8N\$BSz= Q E: @&"E \$80=)<WPpW>8a[DKo=EM 3nG@@@@@8V?p;c {Pc[5Kv[yiv3TRks%mT(B\*hBw(ZTR!vRkykn5y4VZN fZhG]vY>QP`@zZ-"4Q0`Ev `{i<)P,;g-FI}e: Zr.RSjK.k\_=OU\_+r)\_(wPW?I/E{I3B6|\*miRI BR:hNRltn;fgT~9"\*+10:O+(&8H 6Y{Q\_=Pw9PR0TR/(A~^t^n|HW\1ZNA)) a\b:m[1=saZVmm c,'iYJEIc8? K-TrHRTn -]&[oSO=#yCW^ c>3585R>\*MZGA>wP, |Ks/laBw0 ME .w!.>4h^]`pvJYg[iL%me{PXc.T]\*i\h@S](ja<Rt;y9MJ\*QR Pz <sup>2</sup>ZCT[Q=!.Muz{nruo-Lve\uJV&yIcPpX/RXo\*4z@@@@VA?zFes <\*A:["PoV;@\*V@fRt\*W! \*K}k`SD\_wuk1ITtH^-0y LwE [n)D2lVmYE5)sujM}k\{LOsZdk@@@@hk"5)yg{R 12cW :uj]wfm@@@@jC@m'r\$O7u3|dZ9O zEx\$@@@@+GtL#<2&5F\h+pg>^kw9w@@@@:-:y(@\s5v7&G;b[yk/"~AO=>0r@@@@P\*N'Y7Zf{w5XXb {oIr/lxD@@@:I@c  $hZ\pA\{B$ 6@@@@]B@]tn931e!v}h (@@yFN+u]g?pUoKfuZK@@@l:x@Cl/wa2=3:, qCK:SG#Gl}+"oia @ 9;G u-z'O.: z@IDAT c\$  $!@o\p2X@@@@@m7r$ @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r@E\*ba@@@@@jS@m7r @E\*ba@@@@gS@m7r @E\*ba@@@@gS@m7r@E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r @E\*ba@@@@@jS@m7r

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3WTF@@@@eCee@Vw]pe4K@A$]?t]"! @45S&&V)6[@Q
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wxuB@@@@TM@L2FQB@@@R@[j/hve<v}ogY=8v@@@@9
 P'|j<xY=g-)0fwcc%7buMY!VMmc96_WvZvilU92 tyuCv2 oo|0ujK-K+_wQmZV_}vc~lm~li?uYy5Q!p)
+XzZ6XsHqbu'loMkpMR?N}*va{g
r^{S^x4}mlm;3OrG;tm{}[o=klWc9\&w]\&" waj+mq|8{L,/\&|}rO7:d
a`,&]lrzrxOo;f6tO/xw.Q7?/;`mv.~\!q+Fm]<5:l7'Mb7D/o=Tgm_nMc x9~;,h
U3Jn]w7N<Dqme-
f" i%|e0SL{cL v% B-XSO?Wsy^=Ozal-6cL{k!msfwa;}z^z=[av>=dwf/[GvAJY3%\wUW]f#<br/>b
kG \sim slZq9 \sim ?), 6 l{U > = *KH^{S}}
i?~A5@YnP6l!k?t; C![[dw8^5W6zSgnZ:d:D?iQDUi^}{]Z}QgTj^v[?/"Ya2 @F
y)0k,eBJ$k(]B0@BIvwt'z6lM'w`)2xp2{=vW}xnw^=bU/"V^iE;h{)i/p-"N;-
n`@%ZMLZjpw[d2f$:#X12v7mrO;m9v_?m2`g4)yo-370"~|m_
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{/T>)7Ll(-oP,a}0k?>,!Cnbe: @F^dF&m8%X[g2>]|6mT[|!K&oh]Wczq[g'M.i+9ri`W[5w
.o-gF.{xY2FhUX+|/Y%Aml;dZ^L?Lmv~mw^bo{W;1]`|a->-0w=W o
FZO5 \sim z, {!m:^B > Dz^}&+pIZom[[n^hwy]qo @i}NW]?vGrV?~vZkfg5x}nz\`=
\label{eq:last_linear} 4h5ao-L\QyOx]I* \ q^KcQ|= cvL?w \ birder{linear} birder{
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{CG;b]]U>Z
 E&7VZfnlGkXVXasI@@@@@Z3<4HjL zoTZ78oGr=$ N,z2j!I}f?v'Bv~
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:JM0!~%Ez?LV9Tjm
ue_*T:@,6@7mz}G==&~r8:LO`cv{<>y0
@@@@#DRfi^[6|}WvAs{7dy|5iQ)it0 L*=^|"R:`G}O6y]u
6;;U[n|m<8y<92o{(c+.:cmZOLmD{I=Pj\8%g'.'L;x5@*Z=/i<wx)
D2p<W>~{1z$]`Y/tLyIaoHarmWxS?g^{5l~Uw/2NIapxWLOG=a7yx^P&NXb]=.5>nLS!$xjv#S_x*\-
~mq`3foh")TR@^jp>Z @g A+2J,=`M6qV},^>@
.RE]zC(:?;C|Ja'5
Tdu,^qufh}eAG/8iV6q<{Ly =_4i3lvlsYMSv[OSpbx0`9:G@@@:r_|q{KM^Bljx;uUWY
1
klOIOWd!'Zn.P`_^z{H;l6FN9j*vz:zi?kZH=g;}I37gadK`5 oR=a`yTovUX@@@M[yjxw5:
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H;196

oz;k/=\_fm/ ?|;r1Tk,.8!Mnu`\_\_\_\_{6\*|:Gq4p77m?N[>TbK\$! 5W{Wg4(\_r~ s:a~~=j5RJPo]/ol`\_?Yn64@@@@H<#l

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4&Iw_]gWqa@@@@|.57kv }+N>;^)7?{F^d;mo}mZa_FJ<RxF5d^0Hp26+[.oZT`Bc(-
Bv{CRK_~5oZ[#?yzeIv}tw?m?z~<dv=oI
q<68" PY @ZZrksLcj{IC!M>>kn+m28pvEG
dZa>d_{11Hx};+c((G)|N.]^{200}|yU^{uh3lLe}|6=tma
35OM{Dz])]zi6),[50WWWgG@;=Id@@@vwJs~vM6B=3f'H}9$` yyOx9qo-3g}I}8->nj{%^Kzn4_sXfUW}p6eT
Q??aw!<cvo^qA
;@A-a:`]rknkZ<D>.c?_:K.Q8=J^SO=UV4f5j}D;L;+{z\B!+~:8s{in|/oWlytVwLz
&2`x *a}A%+fut)Sk*wMSO?k8&;{Wpgz]"2
;{fwujK
0>kAx|S7ByI8MPc@mA6f6uZ>{=GV5B
v?5)yzO'K.}cCWEWTm>xm;'f7[o{eYO>b;#5Gy7J]5xO<Smo%kCoeg{otOfW}a*/MzuAX:B`X
>I
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dImJw
|CB@@@:@N!wg
7bSL52PRpE(LiN w-[1N;l|b\&K?W fW)\}; jC~dkzzs|rGvp+:o5
<6[m?Onw]wZv] 307>e'+/e!d.mruzKK^L|U u=B=m=#\& / #/l=2@@@
B +f TBY;)s}0qfO?y?5q;}<
}-Zj mn!<a7x8fc7fr7hn6xE[j~ vmXqW^/ z4*jgybO
   @#HhNYF@`QJ+^Ck"]m`kPE~8[jO9Ovj'.=xwg@@@@8*_@V,<('zuYO>uX:=:~
z|Em
f^v!}Wl5-oz-c~@@@@ PK5!0mt+U$ZR@c+.^R\nO ]+
6grsRg~l=9n2]w~zK.wo_|%g& @C
=xL3f \sim S^{5}jS - (0gNBg)
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EMBt=RYKm;ng!#hx8v&{)b]tQ;A@@@jCqj"2KA5q}&cWAjiu4n8O-(Gd@@@-
u}nOaEK.wheUW.d@@@@ZrL^
mcKuMO/:d}Ikh@@@@@21%%1:H.]-L4fZ@@@@@@zR;I <<g f #" R}! 0#xv
   @[
hKm < 0- m)-w@3g{gZ*J'}
\label{eq:constraint} $$ '@<U%[gmQUiW_}v56;#F4:>8<xpyLhgfgx/3fN;Zh![eUlaw#6s]4Fe_|E>}t9ri[IT@|Y=chY@@,e1 Xr\%m!vwyvg] $$ the set of the set of
Do/x;umege>[j_~e]P(7hkYf0`@c=>h@N8[uUme]\pAp
onr}o!zvXb ;*8;`&
  @ h1J6;w}>3SO>92R{~Bc
6 \sim 8t - n Ut
7c~gFzg}-{=DZo=cjvA/l.]Vwu%?og[m]|9sBO?pvGy/byZh}GU\`+Bhu~KCv :Z"m*s=8~H;Sa
@TSr-]ae7?dwjj^hD=M@[
uQT{K?O]ZO%5ZkFKZ'W*W@U
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-qy4@@ :lhSp'W_U6R=mmbKZLw]H7B}?tv5K qA5cu?vu u?
@SN 4(7n.O
z0;C=44A]s9^+h3iZ@@M sk&YD&%jCYeY9n.(gbsP]5y*g\gq?ymqc M6-LVAL^iim}yS5Y2y
*{HclJ5PkGkAD5Joj-w>~jj\N>9Oq?X5M%+/<ukM{@amu}gCD:AIg%0lZyD@hmvqEFR9?~.0
zmkxr^xoBmC-B[]~{[$ j/}.]qsOY;ZW#AF1"f7h#>|xnbMl\n'|GCrHJDji@I>T?y]Ue=OBM[.j;%/Ew94vxM|09F5!
kW}?Gy$L[q2,X+i`^E[o;t?O@C]4mnv,H%vum/Gu{B18*9$C{7]OU|\)O!?ePUrK\~T&et{#}9U@H]E6o_>VsxyJY
}mdkjZx?-RW_~_.IrwU*}{
O[Y^(4Ht[D.(K['xK^~U;]7]oVZkJN]GmW_m]vBs{ :nn?7f;cm%wS6jtF]KU{
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D5ur-\*M{X`J'4fKhneJyuS,k~6-Gqn+hy^ QtwC?>fonKn} vR|q^s><pk2^Y0?^OG~<`,. m^:o}|\/>Cy,{ :vE1\_G~/qu,(:lkPi-<U<@|'\_\_t [{Y sZl!,@@Z @MJo?T0J4?\*&i6T( mAo^ky,,,a#G a\*8zAS@ATA? 1it+^S+// U}9[o1Gp6B@@% G6|p^-(((}?W~kg&}pj9?UWA K)k Ztczt@@[o i^5sy~A1WPXHG[01.oYSO=5 :jyW4?^3viI\*I'ul>:~6kHeWsN??nlT\_|Q60!"x./1+a[)lk-U-BC!}<]OTWTX&yn5/~M>VFtR5&dy >U^zFM7h&Toz\*1w+:3t{+!f+?}.kk(`h+ Z O~UNwQY/z0O9jV(\*xkY;\$SeXiDi,W<VP#T!@-uXC"NS@jA}2}~y/\_Wqe?la7uT+Dt}1TAV@@J@U|keK5`@4T0G I5CR?TQ?IyajekY>#w^&}dw9F~.pRLLJ{P yP!NP\*k%H\*+2YmvvG?QBtE\~XF5)m y: P1}% ?f LLt8j\*EzX\* +jSkG~xXF\*TT9{ RqB6.)h]zmI0k\*WtRpLt 8Ic5OIRX|e-XnBtJBdige j{Nj>tN^@TQ-3[VoguywwlAZi=]]Ae\_-T3\$\_3i <SK;#-" \*x>SVyT`Wl0/"`V^T@#~ZqItT @//\*ubqjA<j>sux ZCm]1?-%T@Sb7KtRK.lXNhH6 =+@,  $0N4\bWHyv_Tl!o<N=9_A\%..P$ lb)v{6X\$"ps^ LN-jeTN%\*W,pZ5g\*e@s6+{Q7/U5eky}P5UV:+BN:(X.{#}>%T@IDATUT?}S` n\_nrIT8KR-W{>c95z:PQ: Pebk}e;-quUl>VEreQdZ/RtTs 3WXy<X\>T|"@\&vV"Rs:'\*Uk:Czy# 7xRyuG<>Zpa4AR5Pbj0/Bym0I /yM0^{5~0Ii91^\$y<Kfx!rJlyuM5=&iZK^`e N#n: 5?A5bMu\$x@|r's^<ws41ymq-@#,}5t:\A`\$yO/9'}y}'W"=0{/M/\_5]z(G`z%81,Mk%uBd{tUBUM8i<`j?[\zaya5jTk^Av=nVrz\*i&O@0L:~Yg'D{5}| @JZ?({YpIU\*uOoy4Xwf{-+%]1QvJY[k03:}%?<A<2pYzyZmP Yq}\$c\$, t&\_9fgyuox|SAw` }|R@`o^@Di]%-T|]7SA[ytOb)oui #5Ov)b^<Uf%>1.\_Ftij@5+{w) -b|L\_oIm\$\z&a-H-[ RI(Z]lB]\*|'3uZk>J3c!hv-u.CA

CRhV[^a

 $\label{eq:uv_discrete} UV[U`4lS~[X~Fm'7z?o[Y5uy$l,>A]0]1]cz]83QR7]'VGJ,UgZr*xlL*Z?\{*lyzc9p=\,^'9^ '@@l;\{pL*oN|4Q?baK\i O8Gov`oB~k!\}u>^u^dk-Zb-xZk?x(^;t1mq-V~rSM. 'U?$C`ZJ[lim9'qMm|L{Z*0L5*UZLU^cMRv^=*W@MLn ^P} ]$ 

 $n+x+j\&{sk}$ 

-y,lk7j25j% 3Ok\:,iU)Mc-8/c1mfNKi[[;^~`>Lt-LS+&PTcZ,g)Jw[yUzn@@ZF@8vRN`r%^?Mct~ UXG7jzeRJPozxS;vj']xnTUR)[LRjW9Z[{8:@nBZu bMP+>Cjv^K.Osi1n\*Smuu'

T`Z\_sBM:5T?//S=unOx3jsg6Z]x SoguU5Wxph+v-Uy,\*'.W}){/)B+ZkPV-^

+u#:4Ku%@JM0uZO2k1iC@h!-6:CKugbUwJUit^jGTV

?5WI,tJ/~Pj^g^=WJ|mV>mWd\_{^[Knj;S /

 $) + @\ ZO a \& EsV, -xU[ryFR6]N-q-B O1 \ Smwx8G] qEYbKKu/-v'8Fj6, |>t=P$ 

```
46{ijn_'nC="b8Jm@ZSu>xq)o1=MK"JVh &$1%6?}iE](vTTJ4DkGl$5*" T/M".RCI?c_1], C@JN1NB
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 $+ ETT1J*XzsI\_, \sim J > Td1cnM4KV \setminus R[K9P[om\_|q{PQK})ET9]tVYWX = g'i*XH + v_01R + t_0NET9$ 

Qp2/)`Z6)P{

U))'Upm"m?u{Gj!nG@@ 6b/PQM'TYk?b5[8PPMVYoyI?TIM45c6qcH??q(hR3XRIkT.dXhzQGE]LdF >uE%u]:>JB

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E[K5+?SC![W#|h,=\$/g]T0r(oRb7"sn^{0k^{T}Mn<0<!kU}
```

\*T!

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 $SUZ\{^{t.})K\ k6Rk)^{JZr=9wX}olx/Vj5.QwI^{,BC1}@@uKbUi\#uAY+2mkN^{\#e`5^{,2}}, ?$ 

^h iK\d9T7'Z?L/(N5#?{wAV\_

```
|[Bd}b)YW>9#x?f<PQBdlyYxa/(xMXfis0Y_k57O@s
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 $\{|SR>dW\qE2drD/,y02rA0k+:&o\_`S?mb,x/hkm[4 \c2Y],eGe:?\}Lo$ 

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9>F8s/lpz<=Fu}`7Z_TJux/yk[9kswWO^{IEljW/p.xkl^^{gB^u|<dk}}
```

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\label{eq:rescaled} Rr2V^>\\ g\%HKgrzaPrqfy\]\ \{?SzS=[od_t0]^<,]gbBJd;q]?brV]\ \{J?u\&8\{<.r9R]5|i^Vo(wtgZWx+p|*|sz??;VL@qvKzk;)~hc-u2@@VPWU\%U*~XO5^t
```

 $K, j \sim lic - u \ge 0 \le V + W \cup \% \cup \% \sim X \cup 1$ 

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^{\*vy`7bNuBio|\*H

YGiubA^:Z@@

&)`

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`i\*yY

\*LsHeT}HjIb=.pW9UCA6J;-

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* '=C2B'W5Yz:k[W~S_:d<A@huNvNOjG~x#ED|0PN5IA,hPxz5i* 7T&ov]b B=s85Z13!](S-t~
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bmOA

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[; MZgTTy\*z,{J?

h?-sSjkQz%JXJ\*SIr\ONA]|&\_Wog]!}V5]WK=

rV>JF5U9#+}7PAZ6{\$ <<}GL\_S

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+gyfA!Jt/wtTQlmRN><Fc @f1~b+y]SYRvp@-?*Zi7
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(f{MzB av46P?-_uVzygfiqyY[OZ{[E}*+/zj M/D
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! zMqLNlj \& + ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} ww5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} wy5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ @4F = 0.5 \label{eq:star} wy5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ wy5 | v6x:3fG?qE]dwq]qo @ wy5 | f | ov_> Tg^i7 @ k,z'.~)?'o~< yvr86w @=lW;Y.2 | v6x:3fG?qE]dwq]qo @ wy5 | v6x:3fG?qE]dwq]dwa | f | v6x:3fG?qE]dwa | f | v6x:3fG?ws5 | f | v6x:3fG?qE]dwa | f | v6x:3fG?ws5 | f
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@  $rj>[I?ALuJ|SLnAGCtN)|\sim:$ 

,@1?i%d+Pc.O\J#KbPrM"B4(P]{wA@J<VWL\*b1bUMEH^Vz9}L+\*ilcz%vw71x\*Rj,f~^9W (R]d\$4]k.U8O:1e Mkz^K.#+<#=x>3^\\*JsS/V)#\$[neXAJ3iV\*3 2k~VDKFz\* V5W[IgR|RoYvs<;];]R,b\Vs FzG7:u mQ|F4dps[=>|R/)Yg @u4: @8saTjS<bd!S(wR/+^Yi|^"RI\$MEmM7-V,(Ug,\_` 3yNZ .)#'vk IXez2I fIA^l"wWE\_c%zsneKKY0\*W[kRu]4\*V3)RifDAJOhwwr\_aj-Q {iRKlwGf2`DQz)@[X+AVK=K#m<B0z1{?ok~&=w?4'}mSF{}W z[nLxR3QRyK%|Rl-qVf,>-</Oc&Y")S,;\!1N|@ 0CzsM 6Re>d}\$\*[bi 1?7u)C}q;SW/Hr;rj/uFi/}N%~V)%Rhr\$w@>f'gf/Jk)TZji[dA0RO>&t)t)2\$no8F8=OYxIK }RL[vM|8;aEfhFPctTjv@{%qFAZh\0Um"/!>8;#Ul3Q\*y3bCwZwT`|W?R3S w.tv8s1A!O%ai`tAKm!af@'MA9S @3\*6W]ItTiEzcz &4)=p'lthVrFii\$TkITJt(V\$-9aLzHx97Fjrz4hk7v/e/r^dYjk[orUJK \*A@Ne zd6~@6kbc:Ck] XE/[9)tE\Ri4W=A2hFgd,(H%~KLOV#Eat-ER{b>XOzvFjoPR5>iGs6UWrnp]eReJ fehK\$D3oKQlC -)FIIRYGCEHiMOeT~)N)]^@Tiu[Cs7^7WUso;M]4{G2DjdF@ iFvtlQzk^=J[vSsmK3J\hwFPG+8v[n)t,?bsK)^=1"dMO|N]AQ r%|100n4G8s-51g5BA6H>c<8{ td24H'NSRB3tM1SA[.z)r#KP^W+@b =dtA @Z.Z:zZ%CSE>RI4"?r'!ED1R)+"]\*EDJu) EEs1--v B-!9QR4u~Wl{Jo7}rK,>bF=xx)Ys.Qr"0--=-bAnWt\_#74 W=  $H1i > k6dD5pGnnn(^{34} + zg^pIr\&k, n*osT \sim h$10pWbR7rMqRBhDJnqF3ed(3L{`=wry}.yaQ^{7})s'u4k!@@\%0TBm.G'absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} bbsolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} bbsolution{\cite{thm:temp}}{2000} bbsolution{\cite{thm:temp}}{2000} absolution{\cite{thm:temp}}{2000} bbsolution{\cite{thm:temp}}{2000} bbsol$ G]VY%F\_}guVU}UG6-O1tiyeijkpKhOgzR?H54O-WJX.\*QR}(R`RGAu-"^krk7`\r~1=;.P<}\$R]/]T"s+,Iy"cFrK:lC>mV K.SJIV-%`Rl\*(\$\*FW{QlsH^}`5B'2"AZQYX+m0@Ky^V[l.I2[W{gn1(,\*'~kKzvJgeiy>LsK|fP5xa{lkfKUw+]C5iV~w~\_gE Y,\*-Rm;Flt{5;C4HJFZ+djq,P [lE?^>:W"\$Nr2/cJd]`%?%.B()#>R9IVV^y^^ cIg"qU7,(pKwK~\IrG'a qCEJIIPXkP\ax1.:>^>>i=!}j7+'^qE8^wn-DWrniPgNrAQ $M!2[L|[]v\g4WL < e\aze;?S|x+B?]U+)_# < PF^:+Ae$ },wYskg9Q n19YVsNtOV7?y]uO<sup>t1</sup>=mvghBY}<DRF}Mu7}>nXL\$Wu-rIzvONi(x3bs}<6w{S^L{]:zJrqg|k} cD\*euV&\$;<%P?br>C+i=7^%aA{Z}O~/M1=78}"I?. zXz+xZiAUW?Jt?>C+}c8km7v1hl~ =F m# @URtIYB03P9#%W-FpR>4>Kt@5Pc^~OcR;GnzrN}Rg2\$0)UAvEV-uKiefd%\*Nu-)#b)5b3R!/TiWiB-}l)%CRV(&}N{)I\_5}vA7=tizkh /~6[RJ/`DJXf 7+J)}>Gyx/Vs.)G\_'e|{^&R~kuGZzu9ro,7`B!eTR~D^\\yb>;:~OJ,zdHdXx7;kPqCO:@\$R2gE5Y~2f1Ik\+1 -2zgJ\_H'Ly>3!nr`yX\*P b!WdWREC5Dn+Cri"W4c5z&|(6GcXVAc,<?\^ls)#]UMzF)MOXd5aKrcB\o2\$tt\S;Am=9^}]3gY:<7:OZy9TkJd|Ep ^\tn~[>\$sN.W5%uP5>LaWfJWL!-y7z5z%R\*r7~KE[ @jK`Y69O>/6h`5{tod H/RT" }QM }XM>MFvv"eBTH)> }C>d>yn),1EoS<^:/>z6/yI'^h;N^Q)uUs.KCJHX\\_n5-N2JQZ3mLfC )ib[:IRcg -y(w~KW,'N 3#v82F6NOpv(.Hc K}#z/W~jA<all!]Wkq+}WcS' LH : NIi& 0L(QD2dUUw[3wt^B m\$@m@6@@']D.@ @h9m2@ @ @@ `9b@ @ @h}js@ PC @ @ @h\*M%Fy#8@ @ @.\*> @ @ vF@::a4 @ @ P Pc@ @ @@:#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @ P 5 @ @ 3 @ @ J`@

@ @\*> @ @ vF@;;a4 @ @ P Pc@ @ @@;#A0@ @ @J @ @ @ N @ @ TB@% @ @ `hg'B @ @\*!Aj@ @ @hg0Fs!@ @ @XNIosl@ @ @@\$vyh4 @ @ @i04!@ @ @vyh4 @ @ @i04!@ @ @<jZ> XM5@ @ @@ 0Cp @ @ V`h+gv@ @ @jH@ R5 @ @ @ V @ @ j@ @ @@[!A @ @ @!5K @ @ B@[9 @ @ PCj!@ @ @mr&h @ @ @0.UC @ @ mL@ @ @@ `!\@@@@PCT @ @ @h+03A; @ @ @5\$Ap @ @ V?&dIENDB`Screenshot 2024-08-20 at 6.00.11/ PM.pngimage/png9 A<J EnUsI)-V{!77 4y\_substg1.0\_370E001F\*Z\_substg1.0\_371D0102\*[\_substg1.0\_3A0C001F\*\\_substg1.0\_80020102\*U !"#\$%&'()\*-./10PNG IHDRpQsRGBgAMAa pHYs%%IR\$UIDATx^xUOH5 (bG{/XQEA:H&#{MB ?,1YY63s==gfx00o0RL`0`ca0/a~0&0a\_010 aL`0`ca0/d8')QO\w,,!%;5.Q'{R4om ]sn\$&&%gRtiZ]v'RJ5"e S"7+e]{HHH7hRZ51xYF9a7 L(9cwhz),,,2 'Tr97N<) 2eut]ZjUm[-"^Z&O,=|wo~tYEC;wn3?CqY>\TM=4iSe?P @\,Br[18x'5"31\$3cr SR%19 uEE:QEt JJ=[sm~\*zn7sQ~6L /6u]'III~M"cO?{TOz~aaywhMad#G/Oye\rUPAM:U>|XbD~G)\_~z<o\_U`'>z.Ai0d%C~\$2gMC9ey'oV+V uU=OnfmB><32o<ZQ1+W?:WwG:7\Ciy7U;:u^[YT,/hocQF,k']R8/+=H3bDys<5 '#@.x6vcw'JxG>kNm ,/+H >a8IH<m\$Y%Av8]{`W^&L# n-vqq,ID4R 8VYnX1+~)yJz;Hmw>(cueaE0^/BCJa)hBK"""Te)re^z\*bSJ(ncz]wyjZPll(QBjKtt,YR=;vh^0!kF\$.]5/ ^/.S#/"|N=zB &Du 7H^]xzu3DK/Tvu\$\$I`RbE];oms\_F}D5kB{9MAL ;|cCoQ/I\*U[R\* I}D!GSw,<yS>{85.%\$cc;#u[z,uNPy iS?BoUB)yv\$+nz(U>+GI HPHTQyNuRSYP9E}~J4\*K{7mM=d[/Q?JrRx1iXw>5Hk?y0Y\_!F  $W_{lc1tEF`@1[nUc(k6_b$)RDC]B/dPpMcG} QsBO-4w6mTG \0wWQZ.erZhh)/yP7q7mN) d!F@_]*.$ 12 q1B=OR\*n<pCZsHH rr5w"9NY0Y.^Ifr8&E<|VIJOTX:&?!W)fy27GejjW6OSeo\$:b!=<l:mKw&cG;RCV}\:y[N6J/?%on.t00oe2e,)WDwcd =&0Yej(Q5BGC 64^w?gysZj7F F\02c;S"##5 a6@C55~xft1+5?;PIabL~~?j\_4iDCcn5rkOC(&Nq\$6;GI:\_CP3/'1\$=.B=IqOKK]1?Z@^)GRRj@J"GjW3bf`iqqsJFxup\*8}0IZyOCI{H\_L&q>#V Oytx8jsy|2rqI91jwe#|:dyipJ`p|tyzN'+VX,Z.q.UBv+A|3d3 LIM"B\*54Bn/k('\z `yA`rAp^\$ ru?h[O<-FVr3]Qp>1F  $<\!\!B"zn\sim\!\!F.inXU|?"nlD}S<\!\!K\sim\!\!7:\!>iOOO||D8g^k \rangle =\!\!\#Jk*1DjH6m+-<\!\!>qvwUnyv<\!8]R`<\!\!8zYG^>\!>Ai*w=w#v<\!U.JE@\&$  $V14#wFlbsB \sim [m2."mW#?R %M > 5R!]Z90z?((C))$ uM8hA?  $\label{eq:starses} 1_`.XfsAXnc!6~lb=(3^Y9Amq;3F-{je\%6.E;,gx|QZ\backslash1!F\$7DzyW|;wgh\-TYN[0'ieRPA<>-$ ^\*:vm2>&`TMX0W\q16\_CE( CLXXp=\ B > AkO\O+k]zC[1g"+Bc\/b+L7[a\*<5y5xG%GXF{L<}j{M"8675]3?tWg`i6"rzW~Cn~#<9 'uN[1TC~W~L.n<?[~|4/}X2X^t!35zt\$BE4&)O 6q?,\$@^qC/>|;

{~9r4ZyUm7L'5/\*#}\_zB^yQi Q&Y!.tV(\_mx\XwSr'wbwQ 3 BE^\exp-?9D0&52-Qw'|P7BKy :o-;^uh}Mg[!. 6T\*z7UB:Go2^+HP rf P<1;KK&<%z~}fxS/(mYp#FR{\$as.;/ecAj]xxF-'88(:& O~. oqoOnO>#<,tFhFzO6ME)f]!,Ai@IO}F+3sw!(\J;J\$=0;X"e\_,Wwkp|T(\$q )a+a0B10Nc!20/a~0&0a\_010 aL`0`ca?Og4ys25a? >#xf\*f}0 w8Pdg1`rIy%@2Y#SoZ|t\*)(w0?^033; >0M7g+b^/#?ff,b 7z>|coF}xYJa^{GPcF`be `.1>LLufa7azfka~gj}1\$&OSC;V0k&f|udNUV tRL701# 1/B -^4qpQ[6 @x N7I" #vL8I 1 &m00Y 0L`&wufYwfX;1yh0fexfeafeZzff^zI=Q!>|i1>aS3 7nXgxfF`/;Nk 0L`/@(b0xg< a5yk =!\*[x? />yOxA=%x>xw2|#|XF\UaF;\*#;?/,cwa >[|w '-bXf^M>s= o /7wsGG[#&`vI&C\$&H%]\_5 mn/AaR%waOca=s2#)z@oX%%\*ooad% LLG,;&bkK!rK\$)o\$\_BrKHB5aFVOF#'|<\$x\$qew a>vaYla0/a~&?~<x[&;O\_:v"EnLJ<hY>^g;11In|vGK2lf}Km^I\ihcM6?djoK{O]uR>Y#BSofx >xvo|\$wRR34Z{7%GbGl\_]7{t YY>&

 $\label{eq:2} zHy7ePLqiS=!113Aeo~p\%:_$\% fNLdLrRb(/KR0)QK\%:*A;:L@BhNV;/$rIhpq;,Z..FGq0|j=*%hj%1tCLXpB3be$+ LtHsYlKBBkR9{\9QBY57mw~R`Rj=~ltId=2grp)]z+\$KW6}+E".%iEE JttOet=uP9r$ZZ=w/^X=Q~[vJ;W|0.D2I#0!s&;wu*/A;J*<d~MRZ;alp:sb)T09-?2GCBA,X ku^g6bf5>|On_h!aPGbS[rHpd<wK>\2<-l(P9sc\r8:YH_sRZSjV3L*vNiIrj0>]9rm8AGp\\\EW-S-]BI\G_h;vJ.WIS$x+{rtb&K[4\Gtl#;56BHRpGK55N}wRv/*/-qZ*$xGi{kU!=nNs.i} LO>%KX\vmoT0o3&w3v.JHp${%9N%t5X@x?9TS7L[7]BQ"48]Q>yt)E?Ux*R%:YIqz^[wyIA N$:9hC:IK%"<\=2h{Zx#$gD} )WS6&@Lx}_+Rjq rcP6pUxXDt$ 

 $\label{eq:sonward} $$\circ\rM/g^L#4py;gK7V|8qBN5$$ 

```
\label{eq:cmp-A-iKzcz=g7y01pw7bJT1_2%Za08o).'w@ECL`0`ca0/a~0&0g*R.rP03&0?C^{SZ~GYh7_O[nE6o,7i8+55j>8/c%Kh2s+Sd%}o-Gg#GW_.=n=S#}wMEEEK1&0K+v.]/xuNM~3]0k
```

 $ERjU{+}8{+}Z{*}UJc\_isCd$ 

j(c#}{9YpH"bPv[u|h5r;

```
\label{eq:mr_action} mr[A^zOzin/X{wg|sMtAfU.|}d*m6OYFw^]qRX1'DvNCs6n1@[8&n2]39O]=Chm&0)[I2ug?<6])T"""hb =z$7jHEC6h kt_~={}!J}Yuq3iBtEi2e/e9R~}Y5o.+WVC5IPGKhYAP3g0[
```

Kg2\*m~e0m~|ma3<21&MTSO=ke.k>/|7jiyLS`A;{O:v(7x5k#</>@^u-7j\$z--S2dxSLyjm:6\*?

 $3^M7e^Z-1?; W\% y8_8^2qD=DvZJF4nf=c!@>/8/\%Jhjr}7\4H<?q]w\\v?, [.[bEiVfmjq"-aC!KK\NOA-1]) \\ (bEiVfmjq"-aC!KK\NOA-1]) \\ (bEiVfmq"-aC!KK\NOA-1]) \\ (bEiVfmq"-aC!KK\NOA-1])$ 

@4Cz!)\_';zbPqc1cdK}C,042@1v0F[v\*:uR1D00?FM|FlsA

icuZlask

CI1 ZW\^#3x |G94i\$0.qE9a%'\_|Q@0@P\.RT

D;vnT\_V\_V-1b@;}QYBiOOXB/>xB#c\r.?PQ0`5gF]mFg8

 $Bx6ia.nY_{qA0} wQQDopRbOo\#q+@$ 

`B: H4qpozbl:t<]0\1cz-xJiKfK?iB: T

 $1 \sim D4yqD.XgB6_e? \&wWpa > :6d \#N \sim IFn8 vqC5xmb@A0 \&= 4.DYVZhX*THJ1PDhQ(\#) fIQH (Marcolar Strength S$ 

 $0!BBi]kB@h/k0cSG_F_PW+c;kyK;1WW\$OFc;rrI4y^-~u`h1uF$ 

 $0/kx.l\#_5@\{HG(c2^*?u!@x/0^;\<?99189r!bM)Nq_1jDic`V2c<Vy[<TzTI\$='!y\$SL\!df29fy80Bca]70$ 

aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca0/a~0&0a\_010 aL`0`ca={c=&zg{s{0W<3EOH/)SHIISGn\*9s0YxTREJ,)K,8/(QB"##eeR@9yTVMVZ%111iSYrTZU<(ua/&::ZjB#  $G{QF[omG>(7|0@rwo)\S:w,}v{nwIJ$!!A?.W_}<X-*5j/ao/Cd*,.AAAC$))Ie*8f'G< y1B|>s!1c;WEka$ ][opcK^NyB v\*F]vm|zM/[n+SX1cG0@;CZl)5J>i)RD\_f<M6vZz,ukDDD]w% Q r'dka;9+00{0&0a S,>#))lHxh]haFOskeR"(0@}Qdadg,Dfa?y0Gb%11aM0"30 aL`0`ca0/a~0&0a 010 aL`0N%08?\$0G%2\_^aal:|0c`0`ca0/a~0&0a\_010 aL`0`ca0/a~0L#xUVyKgruI"EK>nV2dII."Tk975kz0;d#Hppz2k,iws+reIk2bITT )))\*=xw 0Kdy9pzyFDz>,\_~,XU=q];]lS.]n\_>a,0;er-Rrei=ZsqTTI\*3gn{I[7INN'|Rm+'OmqqqcG.9R>\4i"=?~<RF \$G=>n3r: ]3gSBBB\_k~[~IZlnZz{s=ZF{aFvOq2qDcI]e1jN:uM6zj7]dIOaDgxb]mn`1KUl\aZjic=o\~Z>}k;,Y"k>=!5j(TRZW0#  $[38r4K{ ^{y<.e+(P.'|P3x)}}$ ]v ]&:#ZGNogy~ i#qyi>gg}v9rxLeDt[zx<uv]^bqBn]1b.;"q]G}VZuFzs]waFv%=JeO}X L.? %6KLL Wq2`wK;g:G/z661+W5\aQhtE{ }^ytsjy;wePfrB \_hhOW\_?\adW\`pm8wB=|L"'OOE^G> h|GENkq?r~s-)+ FUTnIaCh`?# eG`/FtIjpGit;2r9so& \*^X'MNtc=58^g8\_Z"??yd]v{"EN4t Zc"#zK.6l}Eo]LUIYZHC%K0'Y\$cc< .g8y7xlsD3<xP-)PnSa+g^gT jU 7sy:"}{#`?Cdzk1^u BxMx-m:k08.<L-[j?P}C/a, -=TVM{uV6bs;~n+vdn0%N:nAT17eLl08"30?a0&0a\_010 z0x?")IoK``Yp4IX\_9t|j4mP f2nqL|349ai#6rDEE}\*.44Dv9q<cG=/(N?-{\$,4@J-RPL<~C^9"%x<wk|<nkHhYtiS.|HySad.AeKAZB+]#2"4x1F6I-^L?L,Zc?|X]d5S^w-\_;iM7\/NMIn\rt?~o>UqQrGG6KrJ.ye#6eI.ykH%V)<54&&d\$\yQu&G."i0#pG+/]sn4n@J\*)Z\*V(/2zOS9x\*x;^y)\H= &h>11ddsK -RXohhtpHagXd4hwf,>="qP"X;LdCA cE4&yUdJ\*a&0GQ5a\*@;88Xn~v\_pJ2e~+V={eZ2JbRo ^\_j>/. Bxq(:Yn\*|g{,=^8Ni;Q2nGmKUS&gm]`g\_~5-[doM@\oIev>5WDg;#5dGu-2uL[bcj!4GRF5C~QR% W>GvkDHDXi0B>-K'cc\$"ZDh#t"K2eR0/9xVNQ? 5U]Hd|R@~Z#";}6zEyQzF+^\$\$p/VTV,oBTx&5M)ZpIJNyr;y|)Q<X6iIOGD\$8(@NHp`(+7%HJC8QY-A;Ud6nO ;eP^~'5s0:t4mR5 Dt/+VP PAk\*73BmI~ddYagK0K?aZK{nKY7|-~wXby\Y#Bps+Kf|5jwYt^{}LL<Y9|8]v./c cc>'N}x0R`#Y~KLLzoO%?>~XY?^7 ?f6m|@PZ30-4z^KR Kw\_EYCz;>  $7m\_[\w!C5WPbJ~sn\#Q5[>izn:]E](~e:Bznrf=(Mn?u~qlO>=6.\% \{m\{@nXmA5k\&svG\#c<zhI\&rj>q`)g?F\&M+R'a1\)$ ={MC[j.c<wUK;o<PBonM:u?+BG:t([n;u(~PtiOs+1F7oM@-ZTo)S\$O<1r-\_~?\_G7n8}j]1,-[V[!</R>|1B 3L:UGHioJaRA\_^{K:mNFd\_\_A#

5jwO<KD'\_7~'\_aVtMa,}QF00a,YRsW;WK=oV7n1xkAz8P^F S5k[H\s5zN.BQG;v

W>N6#;#G]C[oz-Zq~LgqFon#2<Q8?`ct8q1hy>-381#Gj;vnIvy#iFcq~.38MuyyK.g:t

 $\label{eq:constraint} U \eqref{constraint} U \eqr$ 

```
BBd<IoF #\9QIH6^7Ot%$7EP0d s<G
P7<(m+Y<0#c7m%D=?u!@>Oyk'xNBB]y|LH'7C~i#dJ.O^&Cixn`A%^O8A>;`i"o>
-"EhyWxLxsxx^C{9q[P>+H:n#nd;T#A?b]k#x6j|^xA'
0"C~gtMFa`H1/yzJf
gTu"O(! o@'i#u =M~SO
\Cpl`#3.b$T6"D?_'Oj\u!l.S6hBu62m@X|t?`hB
z.0 @l='y/!)nj J{1XO=6E8K~pFN(Iz1h;9AC!Pnby BB~?5KHs7GH}AHuw0fl?P~@.#6MZ2cQ |;7<
m9~rI?7sk%Kr+x Y+y|6'-v"_/g.gB|-35acOa~fNxd=:Pdd'Z`!R6Hw7*%^6$/'>91&9 LC1pn7d|aa
L`0`ca0/a~![}amyR^-?L1ax
;w;w9|.bWHr:i2IyqTbrvOH$wx8M=U;q+2;<}}aFv q
XfI}'
[Obw(T_]/>\#9|zM3g_a2_N~7#i72O=6.E>#<"}yT>D>&/~uTH?9uixrec:
Mi=`!=) Wk#EqoA-6nu-uOm!.%i~jB&2]@
IIzIzu]-W_}z_^$wxyryp"GM2E
Ge/T|yy0}}qZ`_%TN:/UK0L`xyq_u4i@J*);]#+U;?A\wDEp1Iciz;(RL6SAL1Yd:{DGEKj~4j}r!M,{C2D=|`9,r6
t5MEHa2syJGU^
0L^C
U
]e!s]wHV~WJKSyE4nYBBN{za}Eo<Br+r=#e lc! ^eD9}:{My0yuY%}ca )+-Y\>c@h2
t0q
u5ixvCGHUeG$)9IL!uui+D+Kkz^I'xdXG`-6'8KrF2`T,Z/0^8)2}Y)ad ></ab V&ul\\kmygzF}"
}$4$Dj8BA*2_>?RW";v5B
Z5'IIRd 9H*%**ZVVECR%5O.AArMv/})Q<X6Lbe9h" q ERRz/q{\
)W$2w#QmM?$^:nX;yOaW8)ev<jNd@3}Gyv ? M6sM!z 7EpfNZjWR?x <+[3eFv& P0H?aZ7N6mJ}23v%C.e
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# 1.51 openjdk-jre 11.0.25u9

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# 1.52 documentformat.openxml.framework 2.19.0

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[https://github.com/DotNetAnalyzers/StyleCopAnalyzers](https://github.com/DotNetAnalyzers/StyleCopAnalyzers)

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yDfA]&N_L^!TuJ\[75kd&Y_.f^7:t!jHq;Pk&K+?]Ga/OY KPy":$%` yLAAIOE
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# 1.53 documentformat.openxml 2.19.0

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## Newtonsoft.Json

Source: [https://github.com/JamesNK/Newtonsoft.Json](https://github.com/JamesNK/Newtonsoft.Json)

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## StyleCopAnalyzers

Source: [https://github.com/DotNetAnalyzers/StyleCopAnalyzers](https://github.com/DotNetAnalyzers/StyleCopAnalyzers)

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:lC79mmo*{k2Wq ((Yf~mf/AVz-yixc<A& U|7Y4=[.= 4d^/xB*98vYw]"kYwZ0x7WoM6v6v3M7)!,z
x[v<~jOA@V^s$h;xsNP4g38JqG$`wARH$1>u@}3>eUV+B3p-Vf]*Q:@'Yo#jM.`[.A2T^:A:dK+
SYF!BI7@D!,Q rF>c 6L!Pi^9
QoFq zHg=_vU):KlG-5b*-Cyn{6Z}J*n
4i"${2 Pm>dVYFa{qx0\py 78d+z#As:Dj:vUM'b'/C\ w",Coc$OkD/ Q
2%aeL?H`@N'$'^,Kpyy~DT@]&XcimDApSY.8#n-mC8KE}V4C2B*K"*VZesk-9
R`SfnEDx)/>Pw[kJ21t%+%F6v$0dz5^; oF\\&W3EsI+V
pmY72XqlR=$3pmgrDZt|Ms1&@L/"a7X9;lmc"db=zl)/LR*u @I
'@CV~bWB,*;s`2
mU:=U+`{Gj3W
0(.TkAc@L<\}=]w5=8o)9KIA[MV]PoTyk=*!A"d_"RcI/TF9z(/*G!V(++9GiDEnC*z*))
I$C!?d3Wj`c-/EYy1bAa"$:X_?e(
=^n;a&tRu|kn>d2yd i N5dR-z#xfydWUJY*r!:zjyvwE.5:o$
?lK/s yl$A9p~r\>FD@4zOeET&b?u)J@1"SY^5tpQnIi)Zf" 5Xx2^t]d-
&6K/(V(,*WF5mcxV6#mT2':2_vuu3Ye@'>@3P_dqfgW/?y\*2okR/w~dNY1#Is(33AE{:*gna2@roF1^L&T<X=dx
~*9> Fz:
'J8pvb4J_h/x05h=::4"eY,MJ&hAhJ F5<6_Mk+AL$CI$!S&_YP??e<o=
1axdV)dy($fHZri&(~!x=^4I
U&|u\vNX5:EkQ'6Tf\,6$E~
&y gr$J6{eTNg=C[[!bER75f%
E,Uu_^TDnX87innP|6Ek1Ew}
AI>6Bc3I&CoH}UaZcXnCmD; $xD/Zn=0\65U|U=FDZ3-.qGcO!^dFY}*xx)e&@,0GR8ek~:~}9L9^2ZZL
)jV]B+`Wzd-+"&B>8Mjutl8uW(J~29Y$P.qDQ1UVr_5/F;+*'0aCqOC\X*Ib!*%f26J
dWth&D,300G&,qeaWqwV@OJ"c7bF::k!C4q%QIY$KU }8i$*e,\(S~F]Y_>Glh.4|fbr6s[]sz_pIhW& $=*h
t)|bpAX3E-V8qKv'Q\,n<8V8&s<7S@H+v
```

 $<\!IP1\$ A\&^{H8g3H\&(X'fs<\$s9Hk`;H<\!Z\$Hm@\&i}V7t4dt+VC;gm6rEiLrV\6,[cYPHp~1FyMm7FS9B\#ib+"X]$ 

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=<\}+B<TT*BI.
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```
\mbox{M} = 10^{1} \mbox{M} \
~6K{\o}}S;Z;-H
$"+dYUo*Z\~^`yeJ([~CtoY`E#HaH"|5wJbbl=
'<G%&^$W9lM;x8]@.gAVfX`EJbTgA%G2f=k-!&hoeN:E Vz281?53}
:&X5"*-!C^%z]GUhW'ZxQ5-i3Fx_yt:eGM.dUh|EonKnHAQn2Iv+*h9P
S3^Wr:gaf
*MUyq
 hmB&,/Fn)cq9azwT
K4-
\label{eq:linear} \#]h+dW5\%u:\f2p\F9^3g`.Km8>U=\_otxs0^*XDhpxpjqIXhK|u\#y\)rP[>e@\[\%,,fdk]]`qfYW7_\U~nUX\_mK7e(R,d|]
 <aP"Gd;+{3_l.7C[_@|LX;6-# 0%#(7k@gJG##z?{w(V'C&5++h,LyktfF6TI#iqis0(u0{Mmr%hMa0G;iU
[E|Yki)=B@qi8eT7?b><w^{!}=epAO<4k|zb,k)2M?{*T&[|*qOfgUQ+7PED&rpGb^{!}@i|5p]}
1\2\Xx[\&
Q5_;D
AQ*tA
[Wf>`S[$%8[qX^p@:DY,tuSjuiiZ8&ZK6/Y/=P
q:B?(XRTxFUR[blZN&aQo"Bi(@4[D]{WRHPmpV4MT5GrU{B~jS{b[#7+P,V ^b.3<~|UX 4:U=n=`jYK1"
Xr(R'+{Zy(`,?4I{*}]0?8{t:A~8x"D'y}}exSq_=TRFxkcr:b!{oUL|29b.EI:4!Ad16/[kte
AKpwjRa < P > pbm{}%Z hKoHAcd:9MCdq?ym$,1f}hsSoxO@_{}{Bxk\@2"ss>6Ad`?44L-5!}
\simfBK|pLO;d8PXcFnRp([9(C.?@T`|0k":Ch$wZ:a+!x
 {(F#QQ;!kL/1CC?N^\U7aG&|#ra3q(!{`U$ds|PZzSsU;uplHJC`KqzAA<=
!>@x6FLeiB4n<D=qdSq[`*eK]+Z}k9n4<NjuMm/ee~t)7i}PiT^:P(>pV[#kz+vcQli/Pf@aS|<V%O
Q8^:d;i[U
=5r*v//ahL
]To8mM+v{Xg`mp@LMwDTus5E&I6#FPO#`uT~S%.`26L`,I|
>DdRuuMVI8dFQ 9Y]v]5v(DV#e?Gct4+p'@FQX)$ 'j2]pq2?2.Xstf0^\z/^[3dQqR:Y!q{&UNY?
+F+GAI\PmF5T$Dy{bLaks}=cx}T19#ShJ-~lcD6ZN]3fV-*N0,H}
f"$=lA#mZa2Uja,]pVX}QA:;T$e`F$1T[}eN.M
AhjAfjrp:"W[Xu)[I-}%$dRp6s!zR<muN!vot~&Q2
.{[<&y{u<owk?Vjul
$]/BV4.5G)L)4SRK D;(7Y7&-vOQ>_.t+?em+z5]{1't%4k#)i)ANrjm4)<!
E_*5fn;aOPjH)-G|g18.LflZ+Z
 .1DZxNSq'[i]
/f?#%Uq-kvw|#Iia[Tn=pkyFJV1t+II]BF9
Hod*2mpC[3v]PCwR{{R%NzFNZurgYZlj^SV63rH $N_J_@1&08LGXKko}V{Td{y}FvY}b: 7/m*I-VargYZlj^SV63rH $N_AJ_@1&08LGXKko}V{Td{y}FvY}b: 7/m*I-VargYZlj^SV63rH $N_AJ_@1&08LGXKko}V{Td{y}FvY}b: 7/m*I-VargYZlj^SV63rH $N_AJ_@1&08LGXKko}V{Td{y}FvY}b: 7/m*I-VargYZlj^SV63rH $N_AJ_@1&08LGXKko}V{Td{y}FvY}b: 7/m*I-VargYZlj^SV63rH $N_AJ_@1&08LGXKko}V{Td{y}FvY}b: 7/m*I-VargYZlj^SV63rH $N_AJ_W{A}J_WAJ_W{A}J_W{A}J_W{A}J_W{A}J_W{A}J_W{A}J_W{A}J_W{A
~1I?pLD1={$8FSnK\XlSV!W;Aj@!CcNa8 cbLq
x=T)aYt-8bBHP)64<!Eoq0 S*WiZ$\-_mvI
TL%--L([qH"4x7e
f!% U6bRr `yEi_d@y$V@,Y#U|ae7[S[,[#
WljTrTI>*vF^rGKf}F<3Rt)3$n
haPV5x`%`iraXV!#I5&QTb{|<eJ >>bSIGU3Znj$sBOR`7e*vO'Tm;#Hfw0RQb$*:4'(cw[=-%\ZO5]p>Zf'
~[Z!R13|!^b1,
-uz+Po=C0ws:eAtf 4tV)r)=+W"-fmCxAa%G`xP2AH~'''=NZ|!+S$GCwp,2QvBc!]qwqp]_&^4Wv/SOG^DM'Ep!g
?eh"d!
z& vplE+D~^
!IVF1i.0w RAQ^8Fg(vG:J@?[0N6`VH,o*'{0:DOS
6B0`-8]hGTa7=Er:ezjEVeiMa75L"^NuSIL,9IrNaeR.
```

```
yDfA]&N_L^!TuJ\[75kd&Y_.f^7:t!jHq;Pk&K+?]Ga/OY KPy":$%` yLAAlOE
```

Dfa8NrBE1xP"P3s'C8eZe,;O;OHg\*j{QB)BI2)

 $L{=}v~7\_ek''25*G(Jqr|hzAblaJiaFaZYD{<,}c\%W)C4?x0H_(JLeeYl/*Y\@aEstzRu$ 

 $; dpF24 s5"#f^{JIpL} > < gR > K & HP < \ bMffG + /X ~ >Q4MMEH - = h978SrI, #q>u@C)y>i"$ 

~2Dw{gRFT=bmdR\{Qx]GgGA.iw:A wr1;{J^r0 UwwP

 $)x.K\&?L[T/Yt|5mlsm\_!pEZ\%1]2P\}3Hv+hy)rwvvv[\ NC-H$ 

.\*"Q9F\$?3"vame2#^(/4I5O]|5egaB~Lv2i\g n^S|P@HU OB\_PStgs<N.?jm,TZI4\$p".ZKJF-IgJpAyp

 $j'fyBG\{F(uj*2b8*yQdK\&^*wjhPHnK"eCrR7U6bNh~B/4*DG.gvoG\$\%(i[a(<uuEh\{>N\$\{akNm;[JZ\$cmyakNm], akNm], akNm], akNm], akNm, ak$ 

 $1\% D \& U1y \#j \{ pCC; > aKz4 \sim 62 > ff4 * x ! q; ^r \{ 2K: " \setminus 9t \} \\ 8c | ib: H/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | K"a-bar | b: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6p1EOv p)7, l, B? | k: h/*o \{ ^mNEs[ < q | ^TL6P1EOv p)7, l, B? | k: h/*$ 

 $N+n\%\,?h'y; \Gamma rE8U*\%\,bIvHN119|9t*^{"}S4Bb|q'eOdJr\$44\#[i$ 

 $e_D\%Gc.@nWCsXzMb"r"t>\!\!<\!\!U\!\!<\!\!@8\!\!<\!\!8d\!\!<\!\!qOBUjaOxk; iF1t@G$ 

AZ[IWv?2kN (>W"

 $\label{eq:constraint} \end{tabular} $$ H''=6\?Z;/-?zL]<O'88i=G+9so`Swa:r? SC4Jsa?{@?l!?xw;K_d_#-3/$ 

jq}}U)m7cNRYS4#MUY`+O1D#zaO39'.79loI

= tqD\$B-mzehW-t)TEt]Bw<?oW\_s8\*;~icHfD-&vGbydn5dI:wAXVMs4x{Uo[~yA ?^y'1x!>G~B%?>EzQgc/?gag 1b9'i-rLld;4G= F.88ObFa?-bjp gQN^:W#F+J0<zEE9KG!NYXs

t`q@`o{'Mv2&e\

![^P)5\*:M2\x4/[<!8-SKeKRj3hj

s\j.K\*`V3~OvdS%kkF Y1`ik BKL:W!-u9ff\zKw^U?qo.mpn]cV)q;mshh/r)1

1

 $!r_Tab>)xeO=I))s^UK/bMn-2~ynz'v}Z}Q[tu}#T.]i^K[N*R,ts\%+zTz]$ 

2F9%Kwbdq\$3)lt~iSv,4wn}e\$O\_sP[/#Cqg%Rknc

 $lvJu\}DYT$ 

3i[7!)ZM# \$?")7PK!Pword/theme/theme1.xmlYOo6w toc'vu-

 $MniP@I ama[4:IGRX^{6}>\$!)O^{r}C\$y@/yH*)UDb` \}"qJX^)\Gamma nEp)liV[]1M<OP6r=zgbIguSebORDqu$ 

 $gZo\simlAplxpT0+[]^jzAV2Fi@qv5\lower_lNleXdsjcs7f$ 

W+7`gJj|h(KD-

dXiJ(x\$(:;!I\_TS1?E??ZBmU/?~xY'y5g&/>GMGeD3Vq%'#q\$8K)fw9:

 $x \} rxwr: \ TZaG*y8IjbRc|XI$ 

u3KGnD1NIBs

RuK>V.EL+M2#'fi~Vvl{u8zH

\*:(W

~JTe\O\*tHGHY}KNP\*T9/#A7qZ\$\*c?qUnwN%Oi4=3P

1Pm(9M2aD];Yt(x]Wr]g-

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eW
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)6-rCSj

 $id \ DAIqbJ\#x6k\#ASh\&t(Q\%p\%m\&]caSl=X\P1Mh9MVdDAaVB[fJP|8AV^{f}]$ 

Hn-"d>zn

```
>b&2vKyD:,AGm\nzi.uYC6OMf3or$5NHT[XF64T,M0E)`#5XY`;%1Um;R>QDDcpU'&LE/pm%]8firS4d7y\`JnIR
3U~7+#mqBiDi*L69mY&iHE=(K&N!V.KeLD{D
```

```
vEdeNe(MN9R6\&3(a/DUz<{YV})9Z[4^n5!J?Q3eBoCMm<.vpIYfZY_p[=al-Y}Nc4vfavl'SA8|*u\{-0\%M07\%<PK!'word/settings.xmlVn8\}/KzD7wHUA<:gp8IL@V2Yc2HJ'GuNPBLIkdfS*iD{V&Ot6}
```

N'JD28{L==/U

nH'

 $6_U(r!Gnr8n6k1(cKt|^s|\$r])12$ 

i2hqNIg}8Qq

SA&{\$XwpK\$=w`@0.Q;RNXHu#q\_5 %M\*O< PU`5qkrTCY>j\_iby<;2|sYn1M?l.U\WHE++igyKDiF/~dK7-#9:X=CzT'2,W5\_~`0jg|tLDe\$#1A]+a= u?ob ]XF{ $3 \sim X$ z'{7\_Q[<>HK#rV[iNGl#>s|4{~`^xKK^I%bw(\*51x;Rc}p{Q~o;Qjj|o t0F(rh6tYN< bkF[ycPm6{Zuz(Tjq8N9)/"mPK!Jword/webSettings.xmlj0{at\_0JHR(/\Gid\$m5lz\_im>Q42 mA < Epy?=Q4 FKWzFMUH;`1sL^6\$oy8|\$\$s}uZK ZyD+,SZC% b?xb9 EqcwPK!=word/styles.xml]s8wf}n6Snf4kr#/#PXC\*1Hz^:Ebci(87\_4 \$8QS"\$<\*\u^HRf @.q(>pi>OHjo\_@YAf&P ]'fu0/gI\*+>W{8 T3:^G)ATTF&Az%R\_ZdGS&g PM  $(by!;s1!x*eO3)(2*?+(=\_\mbox{mdHT1gzBU1jToAdwQV"}A3hQOU\#o/1s]i[]zFr&tnOaXkie4juF$Zg4*uF$3mHaV1F+<<0.5cm}$ z^v,g`}:.r(K<dz+f>ZB?`,ZQoL5|rtWIL"yd1RzMYj\^`nMAwG+4q8)G]&x.CCxf=ghZ)jnV/t(.O.u) >o|;{&-IZaAs\$wNQgeP0lt\_I;A5[tX{Jg<vD 3GRS6v<\*'s1rcPrtHb=<e+Mckyn(5MYfMsrU5~G ~.bkx@8UM]7UA vMop\*RG`#P?M#P?M#Pwn'[VbU!m)x(5@ag&!b'M`N1,,nS7~G ~.bkx@lyx@lm)x(5@ag&V,vj,+Kg&p G7~G O ,6XM77{7NPS vvjjb'RG`#fg&p E4#oxCo VSMMAg\_O:AV8r\$ ,)"#vHG`!(h/vBF\$JSiDOt\?6m2yXR/NjSN03@c|\ Gh6T4bCTqo[PwhBrqH:[8VtX=7n6+XDn-3fEh"M d^ZEwBl.a8.)y>)gkbt1LOr8i8>r:>2i\_7\Aqf!a\_Zz:(Lm?#nc()vB [q] z\*fFD|rqMR0,4<'Rr{UcGa]/DV,8F?4\*:'c/'=3g;)ZP,1X2rg\*Rw[-!efnzVv%#ePK!&&4docProps/core.xml (Ao!](iSFFQ, \_nS5#d[E)6n\_7w{JJ^o:Z#<D D2V5#Tg^b.~+J-QXH/Hfd8D[Z1">z(/s=]dk59x:ci2n\*:Z4hAXKAa"!x)@FQ' Gq|XmX>/ok@[h8r"=Djm8oM9r21,h'o6wt\*jV~.W#or~34 J PK!uc6word/numbering.xml[nF]N [EjuZUU1\*7vN{f 3qX{.,?7G/8)/[?z)oM )^|!|R0>lzxt46{/t3-N]n(t&7GBX)g!EI,4WiqYe9^G(IV(cvOI<Sn4xYWzh@Ec3 ]?!WO7bcHW\_,OM!i)D+l;RFqxrw+m\eVy%6\_O0bHp\$r,p4/ f[on5WW){ ].'d9sq,m`Ollv~ '{7zZ[ltGyF,mdy@0}2RV4T&LCjJpN{-Em--Ldhjorxdh>,|h-Et4y'x-M<1NCrMzp\ Na,Hixi8YiJ\$)1-Qu`RLylfdeHx^PHZeZK\ut ~o^{iBC|Zu|Cc,'n>qF <=T 8TX5?B^=II\*e\_[2|z<W/b}f\$@I?-( wo!t[H'AFM'@\\*I KlKpo O}Pq;pmw \$P)Y2ZXX\_;]2.)4l>d&d{UG6)ou iD/m1Ha>\,'9Dqd%8!k)<\$#2{A)I|5%FR6& V9D.\W>UPxPz}>qCn0Y16X\_)KBML~4WPr}.Ky]runhw,5Z::uw/;!(~lg&t95gbe8kAFK\$W}J'UQ,2n<:drY`599EUY9jB)aD^S|f\Ry4m t+OJ7 Wo-yNpIi)).<7s+O'}#&0 'B @;[L@bt\$r{Z DZ\_&hfk~/

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z[j/"B4|~|U5%.(IJuIIsQgfu?k|3WnPBs0Nsnli

n)nuZ`ZE?!G\$OXcAaPcJ'#ftp[@}!rT;PI\_;}K%k%-U\$\*YI\y6\*L

n6|BIVTgL>)=Ru

~e"l72\*iL"bEQ KD?rh7/0:1\$e

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PK!1TVdocProps/app.xml (T]o0}`(2:Dh=Xsl2&ty_9>>$6l!jgh0LX
m7d&,4<CLn|"#IgiUj[.)
Vpi6SxFt/hT/>{OF"
3(<=UyP\ 2*bt.O.Q|L'<bd
ICq]O<UF+UpZ%X'uVA^dw!r^WJX
&O_
dDp.N--X5^a+1j(8l:8gJAv'rvt{[c*WW[]C2&_].{9_n9Yf?1ai4V+/r:>s]WN(FG
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```

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# 1.56 system.memory 4.5.5

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# 1.58 visual-studio-runtime 14.16.27033

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Martin Richards 23 February 2007 .NET Core uses third-party libraries or other resources that may be distributed under licenses different than the .NET Core software.

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<PropertyGroup>

 $<\!\!OutputType\!\!>\!\!Exe\!<\!\!/OutputType\!\!>$ 

 $<\!\!ApplicationManifest\!\!>\!\!App.manifest\!\!<\!\!/ApplicationManifest\!\!>$ 

<!-- Blocked on ILAsm supporting embedding resources. See https://github.com/dotnet/coreclr/issues/20819 -->

<IIrtTestKind>BuildOnly</IIrtTestKind>

<!-- Test unsupported outside of windows -->

 $<\!\!TestUnsupportedOutsideWindows\!\!>\!\!true\!<\!\!/TestUnsupportedOutsideWindows\!\!>$ 

<DisableProjectBuild Condition="'\$(TargetsUnix)' == 'true'">true</DisableProjectBuild>

<!-- This test would require the runincontext.exe to include App.manifest describing the COM interfaces -->

<UnloadabilityIncompatible>true</UnloadabilityIncompatible>

</PropertyGroup>

<ItemGroup>

<Compile Include="Program.cs" />

<Compile Include="../../ServerContracts/Server.CoClasses.cs" />

 $<\!\!Compile Include=".././ServerContracts/Server.Contracts.cs"/\!\!>$ 

 $<\!\!Compile Include{=}"../../ServerContracts/ServerGuids.cs" /\!\!>$ 

</ItemGroup>

<ItemGroup>

<ProjectReference

Include="../../NativeServer/CMakeLists.txt" />

<ProjectReference Include="\$(TestSourceDir)Common/CoreCLRTestLibrary/CoreCLRTestLibrary.csproj" /> </ItemGroup>

</Project>

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/\* zlib.h -- interface of the 'zlib' general purpose compression library version 1.2.11, January 15th, 2017

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https://github.com/santoshsahoo/nbench (mirror of the same code)

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