The rotchiffre package

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Abstract

This package implements chiffres ROT13 with its variants ROT5, ROT18, and ROT47.

Contents

1 Documentation 2
  1.1 Motivation .................................................. 2
  1.2 Usage ....................................................... 2
    1.2.1 Examples ............................................. 2

2 Implementation 3
  2.1 Reload check and package identification .................. 3
  2.2 Catcodes ................................................... 4
  2.3 Loading resources ......................................... 5
  2.4 \edefRot as robust macro .................................. 5
  2.5 Set \lccode on a range of characters ..................... 6
  2.6 Chiffres ................................................. 7
    2.6.1 ROT13 ............................................... 7
    2.6.2 ROT5 ............................................... 7
    2.6.3 ROT18 ............................................... 7
    2.6.4 ROT47 ............................................... 7
  2.7 \RotCh@rot with big char support ......................... 7
  2.8 \RotCh@rot without big char support ..................... 9

3 Installation 9
  3.1 Download ................................................. 9
  3.2 Bundle installation ...................................... 9
  3.3 Package installation .................................... 9
  3.4 Refresh file name databases ............................ 10
  3.5 Some details for the interested ......................... 10

4 References 10

5 History 11
  [2010/11/12 v1.0] ............................................. 11
  [2016/05/16 v1.1] ............................................. 11

6 Index 11

*Please report any issues at https://github.com/ho-tex/oberdiek/issues
1 Documentation

1.1 Motivation

In the newsgroup comp.text.tex there was a discussion [1] about package fontspec. Stephan Hennig provided an example to implement ROT13 as OpenType feature [2]. And Robin Fairbairns requested a CTAN upload [3].

But I think it would be not fair to the users of old \TeX engines without OpenType support that they will not be able to decrypt texts generated by the new package. Therefore I have written this package that implements ROT13 even for ini\TeX. Also other variants ROT5, ROT18, ROT47 are provided.

1.2 Usage

\texttt{\textbackslash EdefRot \{\textit{type}\} \{\textit{cmd}\} \{\textit{text}\}}

The \textit{text} is expanded and sanitized. All tokens are letters with catcode 12 (other) with the exception of the space token that has character code 32 (0x20) and catcode 10 (space). This follows \TeX's convention of \texttt{\string} and \texttt{\meaning}.

The chiffre type is specified by \textit{type} it takes a number. For example, ROT13 is specified by 13. The selected chiffre is applied to \textit{text} and the result is stored in macro \textit{cmd}.

The following table lists the supported rotation chiffres.

<table>
<thead>
<tr>
<th>chiffre</th>
<th>from</th>
<th>to</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROT13</td>
<td>A-Z</td>
<td>N-Z A-M</td>
</tr>
<tr>
<td></td>
<td>a-z</td>
<td>n-z a-m</td>
</tr>
<tr>
<td>ROT5</td>
<td>0-9</td>
<td>5-9 0-4</td>
</tr>
<tr>
<td>ROT18</td>
<td>A-Z 0-9</td>
<td>S-Z 0-9 A-R</td>
</tr>
<tr>
<td></td>
<td>a-z</td>
<td>n-z a-m</td>
</tr>
<tr>
<td>ROT47</td>
<td>!-~</td>
<td>P-~ !-0</td>
</tr>
</tbody>
</table>

In case of ROT47 the range is the ASCII range from character codes 33 (0x21) ‘!’ upto 126 (0xFE) ‘~’.

The specifications of the algorithms are taken from the description in Wikipedia [4, 5], ROT18 is further specified by “computerfreak” [6].

1.2.1 Examples

The famous English pangram [7] is converted by

\texttt{\EdefRot{13}\result{The quick brown fox jumps over the lazy dog}}

The result is stored in macro \texttt{\result} with the following contents:

\texttt{Gur dhvpx oebja sbk whzcf bire gur ynml qbt}

Command names are converted to strings before. Therefore the text should not contain \TeX markup, example:

\texttt{\EdefRot{13}\result{\texttt{Hello}\par\texttt{World}}} \\ \texttt{\result \rightarrow Uryyb\texttt{nqinapr} \texttt{\textbackslash cne\textbackslash qrnguplfyrf} \texttt{\textbackslash @ar Jbyeq}}

But macros can be used that contain text. They are expanded.
2 Implementation

2.1 Reload check and package identification

Reload check, especially if the package is not used with \LaTeXX.

\begin{group}
def\catcode61\catcode48\catcode32=10\relax\%  
def\catcode13=5 \^^M  
def\catcode6=6 \#  
def\catcode39=12 \,  
def\catcode44=12 \,  
def\catcode45=12 \,  
def\catcode46=12 \,  
def\catcode58=12 \,  
def\catcode64=11 \@  
def\catcode123=1 \{  
def\catcode125=2 \}  
\expandafter\let\expandafter\x\csname ver@rotchiffre.sty\endcsname  
\ifx\x\relax % plain-TeX, first loading  
\else  
\def\empty{}%  
\ifx\x\empty % LaTeX, first loading,  
% variable is initialized, but \ProvidesPackage not yet seen  
\else  
\expandafter\ifx\csname PackageInfo\endcsname\relax  
\immediate\write-1{Package \#1 Info: \#2.}%  
\}%  
\else  
\def\x#1#2{\PackageInfo{#1}{#2, stopped}}%  
\fi  
\x{rotchiffre}{The package is already loaded}%  
\aftergroup\endinput  
\fi  
\fi\%  
\endgroup%

Package identification:

\begin{group}
def\catcode61\catcode48\catcode32=10\relax\%  
def\catcode13=5 \^^M  
def\catcode6=6 \#  
def\catcode39=12 \,  
def\catcode44=12 \,  
def\catcode45=12 \,  
def\catcode46=12 \,  
def\catcode58=12 \,  
def\catcode64=11 \@  
def\catcode123=1 \{  
def\catcode125=2 \}
2.2 Catcodes

\begingroup\catcode61=12 % [ 
\catcode93=12 % ]
\catcode123=1 % {
\catcode125=2 % }
\expandafter\ifx\csname ProvidesPackage\endcsname\relax
\def\x#1#2#3[#4]{\endgroup
\immediate\write-1{Package: #3 #4}\
}\xdef#1{#4}\
\else
\def\x#1#2[#3]{\endgroup
#2[#3]\
\ifx#1\@undefined
\xdef#1{#3}\
\fi
\ifx#1\relax
\xdef#1{#3}\
\fi
}\fi
\expandafter\x\csname ver@rotchiffre.sty\endcsname
\ProvidesPackage{rotchiffre}[
\[2016/05/16 v1.1 Perform simple rotation ciphers (HO)\]]
\begingroup\catcode61=10\relax%
\catcode13=5 % ^{M}
\endlinechar=13 %
\catcode123=1 % {
\catcode125=2 % }
\def\TMP@EnsureCode#1#2{\edef\RotCh@AtEnd{\RotCh@AtEnd\catcode#1=\the\catcode#1\relax
\catcode#1=#2\relax}
}\x\catcode61=10\relax%
\endgroup
\end
\input infwarerr.sty
\input ltxcmds.sty
\input pdfescape.sty
\ifx\RequirePackage\relax
\RequirePackage{infwarerr}[2010/04/08]\relax
\RequirePackage{ltxcmds}[2010/03/01]\relax
\RequirePackage{pdfescape}[2010/03/01]\relax
\else
\fi

2.4 \texttt{\EdefRot} as robust macro

The main macro \texttt{\EdefRot} is made robust if $\varepsilon$-\LaTeX or $\varepsilon$-\TeX are present.

\begin{verbatim}
\ltx@IfUndefined{protected}{%
  \ltx@IfUndefined{DeclareRobustCommand}{%
    \def\RotCh@temp{\def\EdefRot##1}%
  }{%
    \def\RotCh@temp{\DeclareRobustCommand*\EdefRot[1]}%
  }%
  \def\RotCh@temp{\protected\def\EdefRot##1}%
}{}
\RotCh@temp{%
\RotCh@GetNumber{#1}%
\ltx@IfUndefined{RotCh@rot@\romannumeral\RotCh@number}{%
  $\@PackageError{rotchiffre}{$\text{Unknown chiffre ROT}\RotCh@number$}\@ehc
  \EdefSanitize
}{%
  \RotCh@rot%
}}%
\end{verbatim}

\RotCh@GetNumber If $\varepsilon$-\LaTeX is active, then the chiffre number can be an expression supported by \texttt{\numexpr}.
2.5 Set \texttt{\textbackslash lccode} on a range of characters

\texttt{\textbackslash RotCh@number{\textbackslash the\textbackslash expr\#1\textbackslash relax}}

\RotCh@number{%}

}\%

\texttt{\textbackslash RotCh@count}

\countdef\RotCh@count=255 %

\RotCh@count@end

\countdef\RotCh@count@end=2 %

\texttt{\RotCh@RangeIgnore}

\def\RotCh@RangeIgnore{%
\RotCh@loop{%
\lccode\RotCh@count=\ltx@zero
\}%
}

\RotCh@RangeSet

\ltx@IfUndefined{\textbackslash numexpr}{%
\countdef\RotCh@count@temp=4 %
\def\RotCh@RangeSet#1{%
\RotCh@loop{%
\RotCh@count@temp=\RotCh@count
\advance\RotCh@count@temp #1 %
\lccode\RotCh@count=\RotCh@count@temp
\}%
}%
}

\RotCh@loop

\def\RotCh@loop#1#2#3{%
\RotCh@count=#2 %
\RotCh@count@end=#3 %
\def\RotCh@action{#1}%
\RotCh@@loop
}

\RotCh@@loop

\def\RotCh@@loop{%
\RotCh@action
\ifnum\RotCh@count<\RotCh@count@end
\advance\RotCh@count\ltx@one
\expandafter\RotCh@@loop
\fi
}%

\RotCh@loop

\def\RotCh@loop#1#2#3{%
\RotCh@count=#2 %
\RotCh@count@end=#3 %
\def\RotCh@action{#1}%
\RotCh@@loop
}

\RotCh@loop

\def\RotCh@loop{%
\RotCh@action
\ifnum\RotCh@count<\RotCh@count@end
\advance\RotCh@count\ltx@one
\expandafter\RotCh@@loop
\fi
}%
2.6 Chiffres

2.6.1 ROT13

\RotCh@rot@xiii
\def\RotCh@rot@xiii{%
  \RotCh@RangeIgnore{0}{64}%
  \RotCh@RangeSet{+13}{65}{77}%
  \RotCh@RangeSet{-13}{78}{90}%
  \RotCh@RangeIgnore{91}{96}%
  \RotCh@RangeSet{+13}{97}{109}%
  \RotCh@RangeSet{-13}{110}{122}%
  \RotCh@RangeIgnore{123}{255}%
}%

2.6.2 ROT5

\RotCh@rot@v
\def\RotCh@rot@v{%
  \RotCh@RangeIgnore{0}{47}%
  \RotCh@RangeSet{+5}{48}{52}%
  \RotCh@RangeSet{-5}{53}{57}%
  \RotCh@RangeIgnore{58}{255}%
}%

2.6.3 ROT18

\RotCh@rot@xviii
\def\RotCh@rot@xviii{%
  \RotCh@RangeIgnore{0}{47}%
  \RotCh@RangeSet{+25}{48}{57}%
  \RotCh@RangeIgnore{58}{64}%
  \RotCh@RangeSet{+18}{65}{72}%
  \RotCh@RangeSet{-25}{73}{82}%
  \RotCh@RangeSet{-18}{83}{90}%
  \RotCh@RangeIgnore{91}{96}%
  \RotCh@RangeSet{+13}{97}{109}%
  \RotCh@RangeSet{-13}{110}{122}%
  \RotCh@RangeIgnore{123}{255}%
}%

2.6.4 ROT47

\RotCh@rot@xlvii
\def\RotCh@rot@xlvii{%
  \RotCh@RangeIgnore{0}{32}%
  \RotCh@RangeSet{+47}{33}{79}%
  \RotCh@RangeSet{-47}{80}{126}%
  \RotCh@RangeIgnore{127}{255}%
}%

2.7 \RotCh@rot with big char support

Some modern \TeX engines support characters with more than eight bits (codes greater as 255). Lua\TeX and Xe\TeX are detected by the caret notation that is extended by these engines.
\begingroup
\catcode0=9 %
\catcode\^=7 %
\catcode\^^^=12 %
def\x{^^^^0000}\
\expandafter\endgroup
\ifx\x\ltx@empty
\RotCh@toks
\toksdef\RotCh@toks=0 %
\RotCh@rot
\long\def\RotCh@rot#1#2{%
\EdefSanitize#1{#2}%
\begingroup
\csname RotCh@rot@\romannumeral\RotCh@number\endcsname
\RotCh@toks={}%
\expandafter\RotCh@SplitSpace#1 \@nil
\expandafter\endgroup
\expandafter\def\expandafter#1\expandafter{%
\the\RotCh@toks
}%
}%
\RotCh@SplitSpace
\def\RotCh@temp{%
\def\RotCh@SplitSpace##1 ##2\@nil{%
\RotCh@Add##1\relax
\ifx\relax##2\relax
\expandafter\ltx@gobble
\else
\RotCh@toks\expandafter{\the\RotCh@toks#1}%
\expandafter\ltx@firstofone
\fi
\RotCh@SplitSpace##2\@nil
}%
}%
\RotCh@temp{ %
\RotCh@Add
\def\RotCh@Add#1{%
\ifx\ltx@empty\relax
\else
@ifnum'#1>126 %
\RotCh@toks\expandafter{\the\RotCh@toks#1}%
\else
\lowercase{%
\RotCh@toks\expandafter{\the\RotCh@toks#1}%
}%
\fi
\expandafter\RotCh@Add
\fi
}%
2.8 \RotCh@rot without big char support
\RotCh@rot
\long\def\RotCh@rot\@i#2{\%
\EdefSanitize\@i{#2}\%
\begingroup
\csname RotCh@rot@\romannumeral\RotCh@number\endcsname
\lowercase\expandafter{\expandafter\endgroup
\expandafter\def\expandafter#1\expandafter{#1}\%
\fi
\RotCh@AtEnd\%
\(/\package\)

3 Installation

3.1 Download

Package. This package is available on CTAN:\footnote{CTAN:pkg/rotchiffre}

Bundle. All the packages of the bundle ‘oberdiek’ are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.
CTAN:install/macros/latex/contrib/oberdiek.tds.zip
TDS refers to the standard “A Directory Structure for \TeX\ Files” (CTAN:pkg/tds). Directories with \texmf\ in their name are usually organized this way.

3.2 Bundle installation

Unpacking. Unpack the oberdiek.tds.zip in the TDS tree (also known as \texmf\ tree) of your choice. Example (linux):
unzip oberdiek.tds.zip -d ~/texmf

3.3 Package installation

Unpacking. The .dtx file is a self-extracting docstrip archive. The files are extracted by running the .dtx through plain \TeX:\
tex rotchiffre.dtx

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as \texmf\ tree):
rotchiffre.sty \rightarrow tex/generic/oberdiek/rotchiffre.sty
rotchiffre.pdf \rightarrow doc/latex/oberdiek/rotchiffre.pdf
rotchiffre.dtx \rightarrow source/latex/oberdiek/rotchiffre.dtx
If you have a docstrip.cfg that configures and enables docstrip’s TDS installing feature, then some files can already be in the right place, see the documentation of docstrip.

\footnote{CTAN:pkg/rotchiffre}
3.4 Refresh file name databases

If your \TeX{} distribution (\TeX{} Live, MiK\TeX{}, ...) relies on file name databases, you must refresh these. For example, \TeX{} Live users run \texttt{texhash} or \texttt{mktexlsr}.

3.5 Some details for the interested

Unpacking with \LaTeXX. The .dtx chooses its action depending on the format:

\begin{description}
\item[plain \TeX{}] Run \texttt{docstrip} and extract the files.
\item[\LaTeXX] Generate the documentation.
\end{description}

If you insist on using \LaTeXX for \texttt{docstrip} (really, \texttt{docstrip} does not need \LaTeXX), then inform the autodetect routine about your intention:

\begin{verbatim}
l\texttt{\let.install=y\input{rotchiffre.dtx}}
\end{verbatim}

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the .dtx or the .drv to generate the documentation. The process can be configured by the configuration file \texttt{ltxdoc.cfg}. For instance, put this line into this file, if you want to have A4 as paper format:

\begin{verbatim}
\PassOptionsToClass{a4paper}{article}
\end{verbatim}

An example follows how to generate the documentation with pdf\LaTeXX:

\begin{verbatim}
pdflatex rotchiffre.dtx
makeindex \-s gind.ist rotchiffre.idx
pdflatex rotchiffre.dtx
makeindex \-s gind.ist rotchiffre.idx
pdflatex rotchiffre.dtx
\end{verbatim}

4 References

\begin{enumerate}
\item Stephan Hennig et. al.: \textit{fontspec: no ligatures with Times New Roman};
newsgroup \texttt{comp.text.tex},
news:4c4bed27$0$6765$9b4e6d93@newsspool3.arcor-online.net,
2010-11-11.
https://groups.google.com/group/comp.text.tex/browse_thread/thread/
6266f98e998ce333/d7b32e9dce610c87
\item Stephan Hennig: \textit{Re: fontspec: no ligatures with Times New Roman};
newsgroup \texttt{comp.text.tex},
news:4cd2abe$0$6762$9b4e6d93@newsspool3.arcor-online.net,
2010-11-11.
https://groups.google.com/group/comp.text.tex/msg/d7b32e9dce610c87
\item Robin Fairbairn: \textit{Re: fontspec: no ligatures with Times New Roman};
newsgroup \texttt{comp.text.tex}, news:qf4obmua0v.fsf@sxp10.cl.cam.ac.uk,
2010-11-12.
https://groups.google.com/group/comp.text.tex/msg/7c03e91407144704
\item Wikipedia/German: \textit{ROT13}; 2010-10-26.
\end{enumerate}
5 History

[2010/11/12 v1.0]
- First version.

[2016/05/16 v1.1]
- Documentation updates.

6 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; plain numbers refer to the code lines where the entry is used.

Symbols
\@PackageError .......................... 134
\@ehc .................................. 136
\@nil .................................. 233, 240, 249
\@undefined ......................... 58
^ .................................. 222, 223

A
\advance ............................. 163, 183
\aftergroup ...................................

C
\catcode .......................... 2, 3, 5, 6, 7,
8, 9, 10, 11, 12, 13, 33, 34, 36,
37, 38, 39, 40, 41, 42, 43, 44, 45,
46, 47, 48, 49, 69, 70, 72, 73, 74,
78, 79, 80, 81, 82, 83, 84, 87, 88,
90, 91, 92, 93, 97, 99, 221, 222, 223
\countdef ................. 151, 152, 159
\csname ............................... 14, 21, 50, 66, 76, 113, 231, 271

D
\DeclareRobustCommand ....... 126

E
\EdefRot .................. 2, 122
\EdefSanitize .......... 137, 229, 269
\empty ......................... 17, 18
\endsname .................... 14, 21, 50, 66, 76, 113, 231, 271

I
\ifnum .......................... 182, 257
\ifx ......................... 15, 18, 21, 50, 58, 61, 113, 226, 242, 255
\immediate .................... 23, 52
\input .......................... 114, 115, 116

L
\lccode ......................... 155, 164, 170
\lowercase ....................... 260, 272
\ltxempty ...................... 226
\ltxfirstofone ............... 246
\ltxgobble ..................... 243
\ltxIfUndefined .......... 122, 123, 133, 142, 158
\ltxone ...................... 183
\ltxzero ..................... 155

N
\number ......................... 144
\numexpr .......................... 148, 170

P
\PackageInfo ................ 26
\protected .................... 129
\ProvidesPackage .......... 19, 67

R
\RequirePackage .......... 118, 119, 120
\rotch@loop \hspace{1em} 178, 180, 181, 184
\rotch@action \hspace{1em} 177, 181
\rotch@add \hspace{1em} 241, 254
\rotch@atend \hspace{1em} 95, 96, 111, 277
\rotch@count \hspace{1em} 151, 155, 162, 164, 170, 175, 182, 183
\rotch@count@end \hspace{1em} 152
\rotch@count@temp \hspace{1em} 159, 162, 163, 164
\rotch@getnumber \hspace{1em} 132, 142
\rotch@loop \hspace{1em} 154, 161, 169, 174
\rotch@number \hspace{1em} 133, 135, 144, 148, 231, 271
\rotch@rangeignore \hspace{1em} 153, 153, 188, 191, 194, 197, 200, 203, 205, 209, 212, 215, 218
\rotch@rangeset \hspace{1em} 158, 189, 190, 192, 193, 198, 199, 204, 206, 207, 208, 210, 211, 216, 217
\rotch@rot \hspace{1em} 139, 228, 268
\rotch@rotv \hspace{1em} 196
\rotch@rot@xiii \hspace{1em} 187
\rotch@rot@xlvii \hspace{1em} 214
\rotch@rot@xviii \hspace{1em} 202
\rotch@splitspace \hspace{1em} 233, 239
\rotch@temp \hspace{1em} 124, 126, 129, 131, 239, 253
\rotch@toks \hspace{1em} 227, 232, 236, 245, 258, 261
\the \hspace{1em} 77, 78, 79, 80, 81, 82, 83, 84, 97, 148, 236, 245, 258, 261
\tmp@ensurecode \hspace{1em} 94, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110
\toksdef \hspace{1em} 227
\write \hspace{1em} 23, 52
\x \hspace{1em} 14, 15, 18, 22, 26, 28, 51, 56, 66, 75, 87, 224, 226