The rotchiffre package

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Abstract

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

Contents

*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 iniTEX. Also other variants ROT5, ROT18, ROT47 are provided.

1.2 Usage

`\EdefRot` {⟨*type*⟩} {⟨*cmd*⟩} {⟨*text*⟩}

The ⟨*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 `\string` and `\meaning`.

The chiffre type is specified by ⟨*type*⟩ it takes a number. For example, ROT13 is specified by `13`. The selected chiffre is applied to ⟨*text*⟩ and the result is stored in macro ⟨*cmd*⟩.

The following table lists the supported rotation chiffres.

chiffre	from	to
ROT13	A-Z	N-Z A-M
	a-z	n-z a-m
ROT5	0-9	5-9 0-4
ROT18	A-Z 0-9	S-Z 0-9 A-R
	a-z	n-z a-m
ROT47	!-~	P-~ !-O

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

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

The result is stored in macro `\result` with the following contents:

```
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:

```
\EdefRot{13}\result{\texttt{Hello}\par\textit{World}}
\result → Uryyb\nqinapr \cne@qrnguplpyrf \@ar Jbeyq
```

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

```
\newcommand{\Name}{Heiko}
\newcommand{\Email}{heiko.oberdiek at googlemail.com}
\EdefRot{13}\result{Hello \Name\space<\Email>}
\result → Uryyb Urvxb <urvxb.boreqvrx ng tbbtyrznvy.pbz>
```

2 Implementation

1 ⟨*package⟩

2.1 Reload check and package identification

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

```
2 \begingroup\catcode61\catcode48\catcode32=10\relax%
3   \catcode13=5 % ^^M
4   \endlinechar=13 %
5   \catcode35=6 % #
6   \catcode39=12 % '
7   \catcode44=12 % ,
8   \catcode45=12 % -
9   \catcode46=12 % .
10  \catcode58=12 % :
11  \catcode64=11 % @
12  \catcode123=1 % {
13  \catcode125=2 % }
14  \expandafter\let\expandafter\x\csname ver@rotchiffre.sty\endcsname
15  \ifx\x\relax % plain-TeX, first loading
16  \else
17    \def\empty{}%
18    \ifx\x\empty % LaTeX, first loading,
19      % variable is initialized, but \ProvidesPackage not yet seen
20    \else
21      \expandafter\ifx\csname PackageInfo\endcsname\relax
22        \def\x#1#2{%
23          \immediate\write-1{Package #1 Info: #2.}%
24        }%
25      \else
26        \def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
27      \fi
28      \x{rotchiffre}{The package is already loaded}%
29      \aftergroup\endinput
30    \fi
31  \fi
32 \endgroup%
```

Package identification:

```
33 \begingroup\catcode61\catcode48\catcode32=10\relax%
34   \catcode13=5 % ^^M
35   \endlinechar=13 %
36   \catcode35=6 % #
37   \catcode39=12 % '
38   \catcode40=12 % (
39   \catcode41=12 % )
40   \catcode44=12 % ,
41   \catcode45=12 % -
42   \catcode46=12 % .
43   \catcode47=12 % /
44   \catcode58=12 % :
45   \catcode64=11 % @
46   \catcode91=12 % [
47   \catcode93=12 % ]
48   \catcode123=1 % {
49   \catcode125=2 % }
50   \expandafter\ifx\csname ProvidesPackage\endcsname\relax
51     \def\x#1#2#3[#4]{\endgroup
52       \immediate\write-1{Package: #3 #4}%
53       \xdef#1{#4}%
54     }%
55   \else
56     \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)]%
```

2.2 Catcodes

```
\begingroup\catcode61\catcode48\catcode32=10\relax%
  \catcode13=5 % ^^M
  \endlinechar=13 %
  \catcode123=1 % {
  \catcode125=2 % }
  \catcode64=11 % @
  \def\x{\endgroup
    \expandafter\edef\csname RotCh@AtEnd\endcsname{%
      \endlinechar=\the\endlinechar\relax
      \catcode13=\the\catcode13\relax
      \catcode32=\the\catcode32\relax
      \catcode35=\the\catcode35\relax
      \catcode61=\the\catcode61\relax
      \catcode64=\the\catcode64\relax
      \catcode123=\the\catcode123\relax
      \catcode125=\the\catcode125\relax
    }%
  }%
\x\catcode61\catcode48\catcode32=10\relax%
\catcode13=5 % ^^M
\endlinechar=13 %
\catcode35=6 % #
\catcode64=11 % @
\catcode123=1 % {
\catcode125=2 % }
\def\TMP@EnsureCode#1#2{%
  \edef\RotCh@AtEnd{%
    \RotCh@AtEnd
    \catcode#1=\the\catcode#1\relax
  }%
  \catcode#1=#2\relax
}
\TMP@EnsureCode{42}{12}% *
\TMP@EnsureCode{43}{12}% +
\TMP@EnsureCode{45}{12}% -
\TMP@EnsureCode{46}{12}% .
\TMP@EnsureCode{47}{12}% /
\TMP@EnsureCode{60}{12}% <
\TMP@EnsureCode{62}{12}% >
\TMP@EnsureCode{91}{12}% [
\TMP@EnsureCode{93}{12}% ]
\TMP@EnsureCode{96}{12}% `
\edef\RotCh@AtEnd{\RotCh@AtEnd\noexpand\endinput}
```

2.3 Loading resources

```
\begingroup\expandafter\expandafter\expandafter\endgroup
\expandafter\ifx\csname RequirePackage\endcsname\relax
```

```
  \input infwarerr.sty\relax
  \input ltxcmds.sty\relax
  \input pdfescape.sty\relax
\else
  \RequirePackage{infwarerr}[2010/04/08]%
  \RequirePackage{ltxcmds}[2010/03/01]%
  \RequirePackage{pdfescape}[2010/03/01]%
\fi
```

2.4 \EdefRot as robust macro

The main macro \EdefRot is made robust if ε-TEX or LATEX are present.

\EdefRot

```
\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}{%
      Unknown chiffre ROT\RotCh@number
    }\@ehc
    \EdefSanitize
  }{%
    \RotCh@rot
  }%
}
```

\RotCh@GetNumber If ε-TEX is active, then the chiffre number can be an expression supported by \numexpr.

```
\ltx@IfUndefined{numexpr}{%
  \def\RotCh@GetNumber#1{%
    \edef\RotCh@number{\number#1}%
  }%
}{%
  \def\RotCh@GetNumber#1{%
    \edef\RotCh@number{\the\numexpr#1\relax}%
  }%
}
```

2.5 Set \lccode on a range of characters

\RotCh@count

```
\countdef\RotCh@count=255 %
```

\RotCh@count@end

```
\countdef\RotCh@count@end=2 %
```

RotCh@RangeIgnore

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

\RotCh@RangeSet

```
\ltx@IfUndefined{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
    }%
  }%
}{%
  \def\RotCh@RangeSet#1{%
    \RotCh@loop{%
      \lccode\RotCh@count=\numexpr\RotCh@count#1\relax
    }%
  }%
}
```

\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). LuaTEX and XeTEX 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#1{%
    \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#1\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
  }%
\else
```

2.8 \RotCh@rot without big char support

\RotCh@rot

```
  \long\def\RotCh@rot#1#2{%
    \EdefSanitize#1{#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[1]:

CTAN:macros/latex/contrib/oberdiek/rotchiffre.dtx The source file.

CTAN:macros/latex/contrib/oberdiek/rotchiffre.pdf Documentation.

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.

[1] CTAN:pkg/rotchiffre

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 → tex/generic/oberdiek/rotchiffre.sty
rotchiffre.pdf → doc/latex/oberdiek/rotchiffre.pdf
rotchiffre.dtx → 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.

3.4 Refresh file name databases

If your TEX distribution (TEX Live, MiKTEX, ...) relies on file name databases, you must refresh these. For example, TEX Live users run `texhash` or `mktexlsr`.

3.5 Some details for the interested

Unpacking with LATEX. The `.dtx` chooses its action depending on the format:

plain TEX: Run docstrip and extract the files.

LATEX: Generate the documentation.

If you insist on using LATEX for docstrip (really, docstrip does not need LATEX), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{rotchiffre.dtx}
```

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 `ltxdoc.cfg`. For instance, put this line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfLATEX:

```
pdflatex rotchiffre.dtx
makeindex -s gind.ist rotchiffre.idx
pdflatex rotchiffre.dtx
makeindex -s gind.ist rotchiffre.idx
pdflatex rotchiffre.dtx
```

4 References

[1] Stephan Hennig et. al.: *fontspec: no ligatures with Times New Roman*; newsgroup comp.text.tex, news:4cdbed27$0$6765$9b4e6d93@newsspool3.arcor-online.net, 2010-11-11.
https://groups.google.com/group/comp.text.tex/browse_thread/thread/6266f98e998ce333/d7b32e9dcc610c87

[2] Stephan Hennig: *Re: fontspec: no ligatures with Times New Roman*; newsgroup comp.text.tex, news:4cdc2abe$0$6762$9b4e6d93@newsspool3.arcor-online.net, 2010-11-11.
https://groups.google.com/group/comp.text.tex/msg/d7b32e9dcc610c87

[3] Robin Fairbairns: *Re: fontspec: no ligatures with Times New Roman*; newsgroup comp.text.tex, news:qf4obmua0v.fsf@sxp10.cl.cam.ac.uk, 2010-11-12.
https://groups.google.com/group/comp.text.tex/msg/7c03e91407144704

[4] Wikipedia/German: *ROT13*; 2010-10-26.
https://de.wikipedia.org/wiki/ROT13

[5] Wikipedia/English: *ROT13*; 2010-11-11.
https://en.wikipedia.org/wiki/ROT13

[6] Computerfreak/German: *ROT-18*; 2010-04-12.
http://www.compufreak.info/2010/04/12/rot-18/

[7] Wikipedia/English: *The quick brown fox jumps over the lazy dog*; 2010-11-09.
https://en.wikipedia.org/wiki/The_quick_brown_fox_jumps_over_the_lazy_dog

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.