The flags package

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Abstract

Package flags allows the setting and clearing of flags in bit fields and converts the bit field into a decimal number. Currently the bit field is limited to 31 bits.

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1 Documentation

A new powerful package bitset is written by me and supersedes this package:

- The bit range is not restricted to 31 bits, only index numbers are objected to TEX's number limit.
- Many more operations are available.
- No dependency of ε-TEX.

Therefore I consider this package as obsolete and have stopped the development of this package.

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

1.1 User interface

Flag positions are one-based, thus the flag position must be a positive integer. Currently supported range: 1..31

`\resetflags {`⟨*fname*⟩`}`

The bit field ⟨*fname*⟩ is cleared. Currently is is also used for initialization, because a `\newflags` macro is not implemented.

`\setflag {`⟨*fname*⟩`} {`⟨*position*⟩`}`

The flag at bit position ⟨*position*⟩ is set in the bit field ⟨*fname*⟩.

`\clearflag {`⟨*fname*⟩`} {`⟨*position*⟩`}`

The flag at bit position ⟨*position*⟩ is cleared in the bit field ⟨*fname*⟩.

`\printflags {`⟨*fname*⟩`}`

The bit field ⟨*fname*⟩ is converted to a decimal number. The macro is expandible.

`\extractflag {`⟨*fname*⟩`} {`⟨*position*⟩`}`

Extracts the flag setting at bit position ⟨*position*⟩. `\extractflag` expands to `1` if the flag is set and `0` otherwise.

`\queryflag {`⟨*fname*⟩`} {`⟨*position*⟩`} {`⟨*set part*⟩`} {`⟨*clear part*⟩`}`

It is a wrapper for `\extractflag`. ⟨*set part*⟩ is called if `\extractflag` returns `1`. Otherwise ⟨*clear part*⟩ is executed.

Example. See package bookmark. It uses package flags for its font style options.

1.2 Requirements

- ε-TEX (`\numexpr`)

1.3 ToDo

- Named positions.
- Setting positions by a key-value interface.
- Support for more than 31 bits while maintaining expandibility of `\printflags`.
- Eventually `\newflags`, `\newflagstype`.

2 Implementation

```
1 ⟨*package⟩
2 \NeedsTeXFormat{LaTeX2e}
3 \ProvidesPackage{flags}%
4   [2016/05/16 v0.5 Setting/clearing of flags in bit fields (HO)]%
5 \begingroup\expandafter\expandafter\expandafter\endgroup
```

```
\expandafter\ifx\csname numexpr\endcsname\relax
  \PackageError{flags}{%
    Missing e-TeX, package loading aborted%
  }{%
    This packages makes heavy use of \string\numexpr.%
  }%
  \expandafter\endinput
\fi
```

\resetflags

```
\newcommand*{\resetflags}[1]{%
  \expandafter\let\csname flags@#1\endcsname\@empty
}
```

\printflags Macro \printflags converts the bit field into a decimal number.

```
\newcommand*{\printflags}[1]{%
  \expandafter\@printflags\csname flags@#1\endcsname
}
\def\@printflags#1{%
  \expandafter\@firstofone\expandafter{%
    \number\numexpr
    \ifx#1\@empty
      0%
    \else
      \expandafter\@@printflags#1%
    \fi
  }%
}
\def\@@printflags#1#2\fi{%
  \fi
  #1%
  \ifx\\#2\\%
  \else
    +2*\numexpr\expandafter\@@printflags#2%
  \fi
}
```

\setflag

```
\newcommand*{\setflag}[2]{%
  \ifnum#2>\z@
    \expandafter\@setflag\csname flags@#1\expandafter\endcsname
      \expandafter{\romannumeral\number\numexpr#2-1\relax000}%
  \else
    \PackageError{flags}{Position must be a positive number}\@ehc
  \fi
}
\def\@setflag#1#2{%
  \ifx#1\relax
    \let#1\@empty
  \fi
  \edef#1{%
    \expandafter\@@setflag\expandafter{#1}{#2}%
  }%
}
\def\@@setflag#1#2{%
  \ifx\\#1\\%
    \FLAGS@zero#2\relax
    1%
  \else
    \ifx\\#2\\%
      1\@gobble#1%
    \else
      \@@@setflag#1|#2%
```

```
    \fi
  \fi
}
\def\@@@setflag#1#2|#3#4\fi\fi{%
  \fi\fi
  #1%
  \@@setflag{#2}{#4}%
}
```

\clearflag

```
\newcommand*{\clearflag}[2]{%
  \ifnum#2>\z@
    \expandafter\@clearflag\csname flags@#1\expandafter\endcsname
      \expandafter{\romannumeral\number\numexpr#2-1\relax000}%
  \else
    \PackageError{flags}{Position must be a positive number}\@ehc
  \fi
}
\def\@clearflag#1#2{%
  \ifx#1\relax
    \let#1\@empty
  \fi
  \edef#1{%
    \expandafter\@@clearflag\expandafter{#1}{#2}%
  }%
}
\def\@@clearflag#1#2{%
  \ifx\\#1\\%
  \else
    \ifx\\#2\\%
      0\@gobble#1%
    \else
      \@@@clearflag#1|#2%
    \fi
  \fi
}
\def\@@@clearflag#1#2|#3#4\fi\fi{%
  \fi\fi
  #1%
  \@@clearflag{#2}{#4}%
}

\def\FLAGS@zero#1{%
  \ifx#1\relax
  \else
    0%
    \expandafter\FLAGS@zero
  \fi
}
```

\queryflag

```
\newcommand*{\queryflag}[2]{%
  \ifnum\extractflag{#1}{#2}=\@ne
    \expandafter\@firstoftwo
  \else
    \expandafter\@secondoftwo
  \fi
}
```

\extractflag

```
\newcommand*{\extractflag}[1]{%
  \expandafter\@extractflag\csname flags@#1\endcsname
}
```

```
\def\@extractflag#1#2{%
  \ifx#1\@undefined
    0%
  \else
    \ifx#1\relax
      0%
    \else
      \ifx#1\@empty
        0%
      \else
        \expandafter\expandafter\expandafter\@@extractflag
        \expandafter\expandafter\expandafter{%
        \expandafter#1\expandafter
        }\expandafter{%
          \romannumeral\number\numexpr#2-1\relax000%
        }%
      \fi
    \fi
  \fi
}
\def\@@extractflag#1#2{%
  \ifx\\#1\\%
    0%
  \else
    \ifx\\#2\\%
      \@car#1\@nil
    \else
      \@@@extractflag#1|#2%
    \fi
  \fi
}
\def\@@@extractflag#1#2|#3#4\fi\fi{%
  \fi\fi
  \@@extractflag{#2}{#4}%
}
```

⟨/package⟩

3 Installation

3.1 Download

Package. This package is available on CTAN[1]:

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

CTAN:macros/latex/contrib/oberdiek/flags.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:tds/tds.pdf). 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):

[1] http://ctan.org/pkg/flags

```
unzip oberdiek.tds.zip -d ~/texmf
```

Script installation. Check the directory TDS:scripts/oberdiek/ for scripts that need further installation steps. Package attachfile2 comes with the Perl script pdfatfi.pl that should be installed in such a way that it can be called as pdfatfi. Example (linux):

```
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

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 flags.dtx
```

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as texmf tree):

```
flags.sty → tex/latex/oberdiek/flags.sty
flags.pdf → doc/latex/oberdiek/flags.pdf
flags.dtx → source/latex/oberdiek/flags.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 (teTEX, mikTEX, ...) relies on file name databases, you must refresh these. For example, teTEX 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{flags.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 flags.dtx
makeindex -s gind.ist flags.idx
pdflatex flags.dtx
makeindex -s gind.ist flags.idx
pdflatex flags.dtx
```

4 Catalogue

The following XML file can be used as source for the TEX Catalogue. The elements caption and description are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is flags.xml.

```
⟨*catalogue⟩
<?xml version='1.0' encoding='us-ascii'?>
<!DOCTYPE entry SYSTEM 'catalogue.dtd'>
<entry datestamp='$Date$' modifier='$Author$' id='flags'>
  <name>flags</name>
  <caption>Setting and clearing of flags in bit fields.</caption>
  <authorref id='auth:oberdiek'/>
  <copyright owner='Heiko Oberdiek' year='2007'/>
  <license type='lppl1.3'/>
  <version number='0.5'/>
  <description>
    This package allows the setting and clearing
    of flags in bit fields and converts the bit field into a
    decimal number. Currently the bit field is limited to 31 bits.
    <p/>
    It is now deprecated because of new more powerful
    package <xref refid='bitset'>bitset</xref>.
    <p/>
    The package is part of the <xref refid='oberdiek'>oberdiek</xref>
    bundle.
  </description>
  <documentation details='Package documentation'
      href='ctan:/macros/latex/contrib/oberdiek/flags.pdf'/>
  <ctan file='true' path='/macros/latex/contrib/oberdiek/flags.dtx'/>
  <miktex location='oberdiek'/>
  <texlive location='oberdiek'/>
  <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip'/>
</entry>
⟨/catalogue⟩
```

5 History

[2007/02/18 v0.1]

- First version.

[2007/03/07 v0.2]

- Raise an error if ε-TEX is not detected.

[2007/03/31 v0.3]

- \queryflag and \extractflag added.
- Raise an error if position is not positive in case of \setflag and \clearflag.

[2007/09/30 v0.4]

- Package is deprecated because of new more powerful package bitset.

[2016/05/16 v0.5]

- 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.

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