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 \varepsilon\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: $1..31$

\texttt{\resetflags \{\langle fname \rangle\}}

The bit field $\langle fname \rangle$ is cleared. Currently is is also used for initialization, because a \texttt{\newflags} macro is not implemented.

\texttt{\setflag \{\langle fname \rangle\} \{\langle position \rangle\}}

The flag at bit position $\langle position \rangle$ is set in the bit field $\langle fname \rangle$.

\texttt{\clearflag \{\langle fname \rangle\} \{\langle position \rangle\}}

The flag at bit position $\langle position \rangle$ is cleared in the bit field $\langle fname \rangle$.

\texttt{\printflags \{\langle fname \rangle\}}

The bit field $\langle fname \rangle$ is converted to a decimal number. The macro is expandible.

\texttt{\extractflag \{\langle fname \rangle\} \{\langle position \rangle\}}

Extracts the flag setting at bit position $\langle position \rangle$. \texttt{\extractflag} expands to 1 if the flag is set and 0 otherwise.

\texttt{\queryflag \{\langle fname \rangle\} \{\langle position \rangle\} \{\langle set part \rangle\} \{\langle clear part \rangle\}}

It is a wrapper for \texttt{\extractflag}. $\langle set part \rangle$ is called if \texttt{\extractflag} returns 1. Otherwise $\langle clear part \rangle$ is executed.

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

1.2 Requirements

- $\varepsilon$-T\TeX\ ($\texttt{\numexpr}$)

1.3 ToDo

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

\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{flags}  % [2016/05/16 v0.5 Setting/clearing of flags in bit fields (HO)]
\begingroup \expandafter \expandafter \expandafter \endgroup
\ifx \expandafter \ifx \csname numexpr\endcsname \relax
\PackageError{flags}{Missing e-TeX, package loading aborted}
\%
\% This packages makes heavy use of \string\numexpr.\%
\%
\endinput
\fi
\resetflags
\newcommand*{\resetflags}[1]{
\expandafter \let \csname flags@#1\endcsname \@empty}
\printflags
Macro \texttt{\printflags} converts the bit field into a decimal number.
\newcommand*{\printflags}[1]{
\expandafter @\printflags \csname flags@#1\endcsname}
\def @\printflags#1#2\fi{
\fi\% #1\%
\ifx #2\%
+2*\numexpr\expandafter @\printflags #2\fi\%
\fi\%}
\setflag
\newcommand*{\setflag}[2]{
\ifnum #2 > \z@ \expandafter @\setflag \csname flags@#1\expandafter\endcsname\expandafter{\romannumeral \number \numexpr #2 - 1 \relax 000} \else
\PackageError{flags}{Position must be a positive number}\@ehc \fi\%}
\def @\setflag#1#2{\ifx #1 \relax \let #1 \@empty \fi\% #1\%
\ifx #2 \%
+2*\numexpr\expandafter @\setflag #2\fi\%
\fi\%}
\newcommand{\clearflag}[2]{\begingroup
\setcounter{flag}{0}
\def\FLAGS@zero{\relax}
\FLAGS@zero{#2}
\FLAGS@zero{#1}
\let\FLAGS@zero\empty
\let\FLAGS@zero\relax
\FLAGS@zero{#1}
\endgroup}
\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:\cite{CTAN:pkg/flags}:

\url{CTAN:macros/latex/contrib/oberdiek/flags.dtx} The source file.
\url{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.

\url{CTAN:install/macros/latex/contrib/oberdiek.tds.zip}

TDS refers to the standard “A Directory Structure for \TeX\ Files” (\url{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):

\begin{verbatim}
    unzip oberdiek.tds.zip -d ~/texmf
\end{verbatim}

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:

\begin{verbatim}
    tex flags.dtx
\end{verbatim}

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

\begin{verbatim}
    flags.sty \rightarrow tex/latex/oberdiek/flags.sty
    flags.pdf \rightarrow doc/latex/oberdiek/flags.pdf
    flags.dtx \rightarrow source/latex/oberdiek/flags.dtx
\end{verbatim}

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, MiK\TeX, ...) 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{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:

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

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

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

4 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.

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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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