

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 $\epsilon\text{-}\TeX$.

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 $\langle fname \rangle$ is cleared. Currently is also used for initialization, because a `\newflags` macro is not implemented.

`\setflag {⟨fname⟩} {⟨position⟩}`

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

`\clearflag {⟨fname⟩} {⟨position⟩}`

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

`\printflags {⟨fname⟩}`

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

`\extractflag {⟨fname⟩} {⟨position⟩}`

Extracts the flag setting at bit position $\langle position \rangle$. `\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`. $\langle set part \rangle$ is called if `\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

- 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
```

```

6 \expandafter\ifx\csname numexpr\endcsname\relax
7 \PackageError{flags}{%
8   Missing e-TeX, package loading aborted%
9 }{%
10   This packages makes heavy use of \string\numexpr.%
11 }%
12 \expandafter\endinput
13 \fi

\resetflags
14 \newcommand*\resetflags[1]{%
15 \expandafter\let\csname flags@#1\endcsname\@empty
16 }

\printflags Macro \printflags converts the bit field into a decimal number.
17 \newcommand*\printflags[1]{%
18 \expandafter\@printflags\csname flags@#1\endcsname
19 }
20 \def\@printflags#1{%
21 \expandafter\@firstofone\expandafter{%
22   \number\numexpr
23   \ifx#1\@empty
24     0%
25   \else
26     \expandafter\@printflags#1%
27   \fi
28 }%
29 }
30 \def\@@printflags#1#2\fi{%
31 \fi
32 #1%
33 \ifx\#2\%
34 \else
35   +2*\numexpr\expandafter\@@printflags#2%
36 \fi
37 }

\setflag
38 \newcommand*\setflag[2]{%
39 \ifnum#2>\z@
40 \expandafter\@setflag\csname flags@#1\expandafter\endcsname
41 \expandafter{\romannumeral\number\numexpr#2-1\relax000}%
42 \else
43 \PackageError{flags}{Position must be a positive number}\@ehc
44 \fi
45 }
46 \def\@setflag#1#2{%
47 \ifx#1\relax
48 \let#1\@empty
49 \fi
50 \edef#1{%
51 \expandafter\@@setflag\expandafter{#1}{#2}%
52 }%
53 }
54 \def\@@setflag#1#2{%
55 \ifx\#1\%
56 \FLAGS@zero#2\relax
57 1%
58 \else
59 \ifx\#2\%
60 1@gobble#1%
61 \else
62 \@@@setflag#1|#2%

```

```

63   \fi
64   \fi
65 }
66 \def\@@@setflag#1#2|#3#4\fi\fi{%
67   \fi\fi
68   #1%
69   \@@setflag{#2}{#4}%
70 }

\clearflag
71 \newcommand*\clearflag[2]{%
72   \ifnum#2>\z@
73     \expandafter\@clearflag\csname flags@#1\expandafter\endcsname
74     \expandafter{\romannumeral\number\numexpr#2-1\relax000}%
75   \else
76     \PackageError{flags}{Position must be a positive number}\@ehc
77   \fi
78 }
79 \def\@clearflag#1#2{%
80   \ifx#1\relax
81     \let#1\@empty
82   \fi
83   \edef#1{%
84     \expandafter\@clearflag\expandafter{#1}{#2}%
85   }%
86 }
87 \def\@@clearflag#1#2{%
88   \ifx\#1\%
89   \else
90     \ifx\#2\%
91       0@gobble#1%
92     \else
93       \@@clearflag#1|#2%
94     \fi
95   \fi
96 }
97 \def\@@@clearflag#1#2|#3#4\fi\fi{%
98   \fi\fi
99   #1%
100  \@@clearflag{#2}{#4}%
101 }

102 \def\FLAGS@zero#1{%
103   \ifx#1\relax
104   \else
105     0%
106     \expandafter\FLAGS@zero
107   \fi
108 }

\queryflag
109 \newcommand*\queryflag[2]{%
110   \ifnum\extractflag{#1}{#2}=\@ne
111     \expandafter\@firstoftwo
112   \else
113     \expandafter\@secondoftwo
114   \fi
115 }

\extractflag
116 \newcommand*\extractflag[1]{%
117   \expandafter\@extractflag\csname flags@#1\endcsname
118 }

```

```

119 \def\@extractflag#1#2{%
120   \ifx#1\@undefined
121     0%
122   \else
123     \ifx#1\relax
124       0%
125     \else
126       \ifx#1\@empty
127         0%
128       \else
129         \expandafter\expandafter\expandafter\@extractflag
130         \expandafter\expandafter\expandafter{%
131         \expandafter#1\expandafter
132         }\expandafter{%
133         \romannumeral\number\numexpr#2-1\relax000%
134         }%
135       \fi
136     \fi
137   \fi
138 }
139 \def\@@extractflag#1#2{%
140   \ifx\#1\%
141     0%
142   \else
143     \ifx\#2\%
144       \@car#1\@nil
145     \else
146       \@@extractflag#1|#2%
147     \fi
148   \fi
149 }
150 \def\@@@extractflag#1#2|#3#4\fi\fi{%
151   \fi\fi
152   \@extractflag{#2}{#4}%
153 }
154 \end{package}

```

3 Installation

3.1 Download

Package. This package is available on CTAN¹:

[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: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):

¹[CTAN:pkg/flags](#)

```
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 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 (`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{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 `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.

5 Index

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