The uniquecounter package

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Abstract

This package provides a kind of counter that provides unique number values. Several counter can be created by different names. The numeric values are not limited.

Contents

1 Documentation **1**
1.1 Example 2

2 Implementation **2**
2.1 Reload check and package identification 2
2.2 Catcodes 3

3 Test **5**
3.1 Catcode checks for loading 5
3.2 Macro tests 7
3.2.1 Test with LaTeX 7
3.2.2 Test with plain-TeX 8

4 Installation **9**
4.1 Download 9
4.2 Bundle installation 10
4.3 Package installation 10
4.4 Refresh file name databases 10
4.5 Some details for the interested 10

5 History **11**
[2009/09/11 v1.0] 11

6 Index **11**

1 Documentation

`\UniqueCounterNew` {⟨*name*⟩}

Macro `\UniqueCounterNew` creates a new unique counter ⟨*name*⟩. An error is thrown, if the counter already exists.

`\UniqueCounterCall` {⟨*name*⟩} {⟨*code*⟩}

Macro `\UniqueCounterCall` calls the given ⟨*code*⟩ with a new value of counter ⟨*name*⟩ as argument.

`\UniqueCounterIncrement {⟨name⟩}`

Macro `\UniqueCounterIncrement` generates a new value for the counter ⟨*name*⟩ by incrementing by one (globally).

`\UniqueCounterGet {⟨name⟩}`

Expandable macro `\UniqueCounterGet` returns the current value of counter ⟨*name*⟩

1.1 Example

```
⟨*example⟩
\documentclass{minimal}
\usepackage{uniquecounter}
\UniqueCounterNew{anchor}
\makeatletter
\newcommand*{\DefNewAnchorName}[2]{%
  % #1 is unique counter value
  % #2 is name of anchor
  \@namedef{anchor@#2}{a#1}%
}
\newcommand*{\NewAnchorName}[1]{%
  \UniqueCounterCall{anchor}\DefNewAnchorName{#1}%
}
\newcommand*{\PrintAnchorName}[1]{%
  \@nameuse{anchor@#1}%
}
\begin{document}
  \NewAnchorName{Top}%
  \NewAnchorName{Left}%
  \noindent
  Top: \PrintAnchorName{Top}\\%
  Left: \PrintAnchorName{Left}%
\end{document}
⟨/example⟩
```

2 Implementation

```
⟨*package⟩
```

2.1 Reload check and package identification

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

```
\begingroup
  \catcode44 12 % ,
  \catcode45 12 % -
  \catcode46 12 % .
  \catcode58 12 % :
  \catcode64 11 % @
  \catcode123 1 % {
  \catcode125 2 % }
  \expandafter\let\expandafter\x\csname ver@uniquecounter.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
      \catcode35 6 % #
      \expandafter\ifx\csname PackageInfo\endcsname\relax
        \def\x#1#2{%
```

```
          \immediate\write-1{Package #1 Info: #2.}%
        }%
      \else
        \def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
      \fi
      \x{uniquecounter}{The package is already loaded}%
      \aftergroup\endinput
    \fi
  \fi
\endgroup
```

Package identification:

```
\begingroup
  \catcode35 6 % #
  \catcode40 12 % (
  \catcode41 12 % )
  \catcode44 12 % ,
  \catcode45 12 % -
  \catcode46 12 % .
  \catcode47 12 % /
  \catcode58 12 % :
  \catcode64 11 % @
  \catcode91 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@uniquecounter.sty\endcsname
\ProvidesPackage{uniquecounter}%
  [2009/09/11 v1.0 Provides unlimited unique counter (HO)]
```

2.2 Catcodes

```
\begingroup
  \catcode123 1 % {
  \catcode125 2 % }
  \def\x{\endgroup
    \expandafter\edef\csname uqc@AtEnd\endcsname{%
      \catcode35 \the\catcode35\relax
      \catcode64 \the\catcode64\relax
      \catcode123 \the\catcode123\relax
      \catcode125 \the\catcode125\relax
    }%
  }%
\x
\catcode35 6 % #
\catcode64 11 % @
\catcode123 1 % {
```

```
\catcode125 2 % }
\def\TMP@EnsureCode#1#2{%
  \edef\uqc@AtEnd{%
    \uqc@AtEnd
    \catcode#1 \the\catcode#1\relax
  }%
  \catcode#1 #2\relax
}
\TMP@EnsureCode{33}{12}% !
\TMP@EnsureCode{39}{12}% ’
\TMP@EnsureCode{42}{12}% *
\TMP@EnsureCode{43}{12}% +
\TMP@EnsureCode{46}{12}% .
\TMP@EnsureCode{47}{12}% /
\TMP@EnsureCode{61}{12}% =
\TMP@EnsureCode{96}{12}% ‘
\begingroup\expandafter\expandafter\expandafter\endgroup
\expandafter\ifx\csname RequirePackage\endcsname\relax
  \input bigintcalc.sty\relax
  \input infwarerr.sty\relax
\else
  \RequirePackage{bigintcalc}[2007/11/11]%
  \RequirePackage{infwarerr}[2007/09/09]%
\fi
```

`\uqc@IncNum`

```
\begingroup\expandafter\expandafter\expandafter\endgroup
\expandafter\ifx\csname numexpr\endcsname\relax
  \def\uqc@IncNum#1{%
    \begingroup
      \count@=\csname uqc@cnt@#1\endcsname\relax
      \advance\count@\@ne
      \expandafter\xdef\csname uqc@cnt@#1\endcsname{%
        \number\count@
      }%
      \ifnum\count@=2147483647 %
        \global\expandafter\let\csname uqc@inc@#1\endcsname
        \uqc@IncBig
      \fi
    \endgroup
  }%
\else
  \def\uqc@IncNum#1{%
    \expandafter\xdef\csname uqc@cnt@#1\endcsname{%
      \number\numexpr\csname uqc@cnt@#1\endcsname+1%
    }%
    \ifnum\csname uqc@cnt@#1\endcsname=2147483647 %
      \global\expandafter\let\csname uqc@inc@#1\endcsname
      \uqc@IncBig
    \fi
  }%
\fi
```

`\uqc@IncBig`

```
\def\uqc@IncBig#1{%
  \expandafter\xdef\csname uqc@cnt@#1\endcsname{%
    \expandafter\expandafter\expandafter
    \BigIntCalcInc\csname uqc@cnt@#1\endcsname!%
  }%
}
```

`\uqc@Def`

```
\begingroup\expandafter\expandafter\expandafter\endgroup
\expandafter\ifx\csname newcommand\endcsname\relax
  \def\uqc@Def#1{\def#1##1}%
\else
  \def\uqc@Def#1{\newcommand*{#1}[1]}%
\fi
```

`\UniqueCounterNew`

```
\uqc@Def\UniqueCounterNew{%
  \expandafter\ifx\csname uqc@cnt@#1\endcsname\relax
    \expandafter\xdef\csname uqc@cnt@#1\endcsname{0}%
    \global\expandafter\let\csname uqc@inc@#1\endcsname\uqc@IncNum
    \@PackageInfo{uniquecounter}{New unique counter `#1'}%
  \else
    \@PackageError{uniquecounter}{Unique counter `#1' is already defined}\@ehc
  \fi
}
```

`\UniqueCounterIncrement`

```
\uqc@Def\UniqueCounterIncrement{%
  \expandafter\ifx\csname uqc@cnt@#1\endcsname\relax
    \@PackageError{uniquecounter}{Unique counter `#1' is undefined}\@ehc
  \else
    \csname uqc@inc@#1\endcsname{#1}%
  \fi
}
```

`\UniqueCounterGet`

```
\uqc@Def\UniqueCounterGet{%
  \csname uqc@cnt@#1\endcsname
}
```

`\UniqueCounterCall`

```
\uqc@Def\UniqueCounterCall{%
  \expandafter\ifx\csname uqc@cnt@#1\endcsname\relax
    \@PackageError{uniquecounter}{Unique counter `#1' is undefined}\@ehc
    \expandafter\uqc@Call\expandafter0%
  \else
    \UniqueCounterIncrement{#1}%
    \expandafter\expandafter\expandafter\uqc@Call
    \csname uqc@cnt@#1\expandafter\endcsname
  \fi
}
```

`\uqc@Call`

```
\long\def\uqc@Call#1#2{#2{#1}}%

\uqc@AtEnd
```

⟨/package⟩

3 Test

3.1 Catcode checks for loading

⟨*test1⟩

```
\catcode`\{=1 %
\catcode`\}=2 %
\catcode`\#=6 %
\catcode`\@=11 %
\expandafter\ifx\csname count@\endcsname\relax
```

```
  \countdef\count@=255 %
\fi
\expandafter\ifx\csname @gobble\endcsname\relax
  \long\def\@gobble#1{}%
\fi
\expandafter\ifx\csname @firstofone\endcsname\relax
  \long\def\@firstofone#1{#1}%
\fi
\expandafter\ifx\csname loop\endcsname\relax
  \expandafter\@firstofone
\else
  \expandafter\@gobble
\fi
{%
  \def\loop#1\repeat{%
    \def\body{#1}%
    \iterate
  }%
  \def\iterate{%
    \body
      \let\next\iterate
    \else
      \let\next\relax
    \fi
    \next
  }%
  \let\repeat=\fi
}%
\def\RestoreCatcodes{}
\count@=0 %
\loop
  \edef\RestoreCatcodes{%
    \RestoreCatcodes
    \catcode\the\count@=\the\catcode\count@\relax
  }%
\ifnum\count@<255 %
  \advance\count@ 1 %
\repeat

\def\RangeCatcodeInvalid#1#2{%
  \count@=#1\relax
  \loop
    \catcode\count@=15 %
  \ifnum\count@<#2\relax
    \advance\count@ 1 %
  \repeat
}
\expandafter\ifx\csname LoadCommand\endcsname\relax
  \def\LoadCommand{\input uniquecounter.sty\relax}%
\fi
\def\Test{%
  \RangeCatcodeInvalid{0}{47}%
  \RangeCatcodeInvalid{58}{64}%
  \RangeCatcodeInvalid{91}{96}%
  \RangeCatcodeInvalid{123}{255}%
  \catcode`\@=12 %
  \catcode`\\=0 %
  \catcode`\{=1 %
  \catcode`\}=2 %
  \catcode`\#=6 %
  \catcode`\[=12 %
  \catcode`\]=12 %
```

```
  \catcode`\%=14 %
  \catcode`\ =10 %
  \catcode13=5 %
  \LoadCommand
  \RestoreCatcodes
}
\Test
\csname @@end\endcsname
\end
```

⟨/test1⟩

3.2 Macro tests

3.2.1 Test with LaTeX

⟨*test2⟩

```
\NeedsTeXFormat{LaTeX2e}
\nofiles
\documentclass{minimal}
\usepackage{uniquecounter}[2009/09/11]
\usepackage{qstest}
\IncludeTests{*}
\LogTests{log}{*}{*}

\newcommand*{\CheckValue}[2]{%
  \Expect*{#2}*{\UniqueCounterGet{#1}}%
}
\newcommand*{\CheckSpace}[1]{%
  \sbox0{#1}%
  \Expect{0.0pt}*{\the\wd0}%
}

\begin{qstest}{creation}{creation}
  \CheckSpace{%
    \UniqueCounterNew{test}%
  }%
  \CheckValue{test}{0}%
\end{qstest}

\begin{qstest}{increment}{increment}
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
  \CheckValue{test}{1}%
  \makeatletter
  \def\uqc@cnt@test{2147483645}%
  \CheckValue{test}{2147483645}%
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
  \CheckValue{test}{2147483646}%
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
  \Expect{true}*{\ifx\uqc@inc\uqc@NumInc true\else false\fi}%
  \CheckValue{test}{2147483647}%
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
  \CheckValue{test}{2147483648}%
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
```

```
  \CheckValue{test}{2147483649}%
\end{qstest}

\begin{qstest}{call}{call}
  \def\CheckCall#1#2{%
    \Expect{#1}{#2}%
  }%
  \CheckSpace{%
    \UniqueCounterNew{foo}%
  }%
  \CheckValue{foo}{0}%
  \CheckSpace{%
    \UniqueCounterCall{foo}{\CheckCall}{1}%
  }%
  \CheckSpace{%
    \UniqueCounterCall{foo}{\CheckCall}{2}%
  }%
  \CheckValue{foo}{2}%
\end{qstest}

\csname @@end\endcsname
```
⟨/test2⟩

3.2.2 Test with plain-TEX

```
⟨*test3⟩
\input uniquecounter.sty\relax
\catcode`\@=11 %
\def\CheckValue#1#2{%
  \begingroup
    \edef\A{#2}%
    \edef\B{\UniqueCounterGet{#1}}%
    \ifx\A\B
    \else
      \@PackageError{TEST}{Failed: \A\space<> \B}\@ehc
    \fi
  \endgroup
}
\def\CheckSpace#1{%
  \setbox0=\hbox{#1}%
  \ifdim\wd0=\z@
  \else
    \@PackageError{TEST}{Failed: 0.0pt <> \the\wd0}\@ehc
  \fi
}

\begingroup
  \CheckSpace{%
    \UniqueCounterNew{test}%
  }%
  \CheckValue{test}{0}%
\endgroup

\begingroup
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
  \CheckValue{test}{1}%
  \def\uqc@cnt@test{2147483645}%
  \CheckValue{test}{2147483645}%
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
  \CheckValue{test}{2147483646}%
```

```
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
  \ifx\uqc@inc\uqc@NumInc
  \else
    \@PackageError{TEST}{Failed: wrong inc function}\@ehc
  \fi
  \CheckValue{test}{2147483647}%
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
  \CheckValue{test}{2147483648}%
  \CheckSpace{%
    \UniqueCounterIncrement{test}%
  }%
  \CheckValue{test}{2147483649}%
\endgroup
\begingroup
  \def\CheckCall#1#2{%
    \begingroup
      \def\A{#1}%
      \def\B{#2}%
      \ifx\A\B
      \else
        \@PackageError{TEST}{Failed: \A\space <> \B}\@ehc
      \fi
    \endgroup
  }%
  \CheckSpace{%
    \UniqueCounterNew{foo}%
  }%
  \CheckValue{foo}{0}%
  \CheckSpace{%
    \UniqueCounterCall{foo}{\CheckCall}{1}%
  }%
  \CheckSpace{%
    \UniqueCounterCall{foo}{\CheckCall}{2}%
  }%
  \CheckValue{foo}{2}%
\endgroup
\csname @@end\endcsname\end
⟨/test3⟩
```

4 Installation

4.1 Download

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

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

CTAN:macros/latex/contrib/oberdiek/uniquecounter.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.

[1] ftp://ftp.ctan.org/tex-archive/

4.2 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
```

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/
```

4.3 Package installation

Unpacking. The `.dtx` file is a self-extracting docstrip archive. The files are extracted by running the `.dtx` through plain-TEX:

```
tex uniquecounter.dtx
```

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

```
uniquecounter.sty            → tex/generic/oberdiek/uniquecounter.sty
uniquecounter.pdf            → doc/latex/oberdiek/uniquecounter.pdf
uniquecounter-example.tex    → doc/latex/oberdiek/uniquecounter-example.tex
test/uniquecounter-test1.tex → doc/latex/oberdiek/test/uniquecounter-test1.tex
test/uniquecounter-test2.tex → doc/latex/oberdiek/test/uniquecounter-test2.tex
test/uniquecounter-test3.tex → doc/latex/oberdiek/test/uniquecounter-test3.tex
uniquecounter.dtx            → source/latex/oberdiek/uniquecounter.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.

4.4 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`.

4.5 Some details for the interested

Attached source. The PDF documentation on CTAN also includes the `.dtx` source file. It can be extracted by AcrobatReader 6 or higher. Another option is pdftk, e.g. unpack the file into the current directory:

```
pdftk uniquecounter.pdf unpack_files output .
```

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{uniquecounter.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 uniquecounter.dtx
makeindex -s gind.ist uniquecounter.idx
pdflatex uniquecounter.dtx
makeindex -s gind.ist uniquecounter.idx
pdflatex uniquecounter.dtx
```

5 History

[2009/09/11 v1.0]

- First public version.

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; numbers in roman refer to the code lines where the entry is used.

Symbols

\# 199, 261
\% 264
\@ 200, 257, 346
\@PackageError 170, 175, 185, 353, 361, 388, 407
\@PackageInfo 168
\@ehc . 170, 175, 185, 353, 361, 388, 407
\@firstofone 208, 211
\@gobble 205, 213
\@namedef 9
\@nameuse 15
\@ne 131
\@undefined 76
\[. 262
\\ 21, 258
\{ 197, 259
\} 198, 260
\] 263
\␣ 265

A

\A 349, 351, 353, 403, 405, 407
\advance 131, 238, 246
\aftergroup 50

B

\B 350, 351, 353, 404, 405, 407
\begin 17, 291, 298, 325
\BigIntCalcInc 155
\body 217, 221

C

\catcode 27, 28, 29, 30, 31, 32, 33, 41, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 88, 89, 92, 93, 94, 95, 99, 100, 101, 102, 106, 108, 197, 198, 199, 200, 235, 244, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 346
\CheckCall 326, 334, 337, 401, 416, 419
\CheckSpace 286, 292, 299, 306, 310, 315, 319, 329, 333, 336, 357, 366, 373, 379, 383, 391, 395, 411, 415, 418
\CheckValue 283, 295, 302, 305, 309, 314, 318, 322, 332, 339, 347, 369, 376, 378, 382, 390, 394, 398, 414, 421
\count@ 130, 131, 133, 135, 202, 231, 235, 237, 238, 242, 244, 245, 246
\countdef 202
\csname 34, 42, 68, 84, 91, 119, 127, 130, 132, 136, 143, 144, 146, 147, 153, 155, 159, 165, 166, 167, 174, 177, 181, 184, 190, 201, 204, 207, 210, 249, 271, 342, 423

D

\DefNewAnchorName 6, 12
\documentclass 2, 277

E

\empty 37, 38
\end 23, 272, 296, 323, 340, 423

\endcsname 34, 42, 68, 84, 91, 119, 127, 130, 132, 136, 143, 144, 146, 147, 153, 155, 159, 165, 166, 167, 174, 177, 181, 184, 190, 201, 204, 207, 210, 249, 271, 342, 423
\endinput 50
\Expect 284, 288, 313, 327

H

\hbox 358

I

\ifdim 359
\ifnum 135, 146, 237, 245
\ifx . 35, 38, 42, 68, 76, 79, 119, 127, 159, 165, 174, 184, 201, 204, 207, 210, 249, 313, 351, 386, 405
\immediate 44, 70
\IncludeTests 280
\input 120, 121, 250, 345
\iterate 218, 220, 222

L

\LoadCommand 250, 267
\LogTests 281
\loop 216, 232, 243

M

\makeatletter 5, 303

N

\NeedsTeXFormat 275
\NewAnchorName 11, 18, 19
\newcommand . . . 6, 11, 14, 162, 283, 286
\next 222, 224, 226
\nofiles 276
\noindent 20
\number 133, 144
\numexpr 144

P

\PackageInfo 47
\PrintAnchorName 14, 21, 22
\ProvidesPackage 39, 85

R

\RangeCatcodeInvalid 241, 253, 254, 255, 256
\repeat 216, 228, 239, 247
\RequirePackage 123, 124
\RestoreCatcodes . . 230, 233, 234, 268

S

\sbox 287
\setbox 358
\space 353, 407

T

\Test 252, 270
\the . . 92, 93, 94, 95, 106, 235, 288, 361
\TMP@EnsureCode 103, 110, 111, 112, 113, 114, 115, 116, 117

U

\UniqueCounterCall 1, 12, 183, 334, 337, 416, 419
\UniqueCounterGet . . . 2, 180, 284, 350
\UniqueCounterIncrement 2, 173, 188, 300, 307, 311, 316, 320, 374, 380, 384, 392, 396
\UniqueCounterNew 1, 4, 164, 293, 330, 367, 412
\uqc@AtEnd 104, 105, 194
\uqc@Call 186, 189, 193
\uqc@cnt@test 304, 377
\uqc@Def 158, 164, 173, 180, 183
\uqc@inc 313, 386
\uqc@IncBig 137, 148, 152
\uqc@IncNum 126, 167
\uqc@NumInc 313, 386
\usepackage 3, 278, 279

W

\wd 288, 359, 361
\write 44, 70

X

\x 34, 35, 38, 43, 47, 49, 69, 74, 84, 90, 98

Z

\z@ 359