The \texttt{mleftright} package

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Abstract

\LaTeX{} sets subformulas by \texttt{\textbackslash left} and \texttt{\textbackslash right} as inner formulas with additional surrounding spaces in some situations. This package provides \texttt{\mleft} and \texttt{\mright} that call \texttt{\textbackslash left} and \texttt{\textbackslash right}, but the delimiters will act as normal \texttt{\mathopen} and \texttt{\mathclose} delimiters without the additional space of an inner formula.

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1 Documentation

The package is a result of a thread in the newsgroup \texttt{comp.text.tex} with the subject \textit{spacing after \textbackslash right} and before \texttt{\textbackslash left}) \cite{1}. The problem: \texttt{\textbackslash left} and \texttt{\textbackslash right} adjust the size of the delimiters automatically. However, \LaTeX{} treats the whole expression as inner formula. In some circumstances \LaTeX{} adds extra space before or after an inner formula. Example:

\cite{1}
\[
\sin(x^2), x \quad \Rightarrow \quad \sin(x^2), x
\]
\[
\sin\left(x^2\right), x \quad \Rightarrow \quad \sin\left(x^2\right), x
\]
\[
\sin\mleft(x^2\mright), x \quad \Rightarrow \quad \sin(x^2), x
\]

(\texttt{\textbackslash mleft} and \texttt{\textbackslash mright} are provided by this package.)

In the newsgroup Donald Arseneau answered with clever macros [2]:

\begin{verbatim}
\newcommand\lft{\mathopen{}\left}
\newcommand\rgt{\aftergroup\mathclose\aftergroup{\aftergroup}{\right}}
\end{verbatim}

However one problem remains, a following subscript or superscript is not applied to the right delimiter but the empty \texttt{\mathclose}. Thus Philipp Stephani provided an improvement [3]:

\[
\mathopen{} \mathclose{\left\| A^2 \right\|}_2
\]

Heiko Oberdiek converted this into macro form [4]:

\begin{verbatim}
\newcommand\lft{\mathopen{}\mathclose{\left}}
\newcommand\rgt{\aftergroup\mathclose{\right}}
\end{verbatim}

The package uses longer macro names \texttt{\textbackslash mleft} and \texttt{\textbackslash mright} to avoid name clashes. Also it adds some checks for error conditions.

1.1 Use

\texttt{\textbackslash mleft(} {\textit{delimL}} \ldots \texttt{\textbackslash mright(} {\textit{delimR}} \texttt{)}

Macros \texttt{\textbackslash mleft} and \texttt{\textbackslash mright} are used in the same way as \texttt{\textbackslash left} and \texttt{\textbackslash right}. Also \texttt{\textbackslash middle} can be used inbetween if \texttt{\varepsilon-\TeX} is present.

\texttt{\textbackslash mleft\textbackslash right}

Macro \texttt{\textbackslash mleft\textbackslash right} redefines \texttt{\textbackslash left} as \texttt{\textbackslash mleft} and \texttt{\textbackslash right} as \texttt{\textbackslash mright}. The redefinition is local to the group.

\texttt{\textbackslash mleft\textbackslash right\textbackslash restore}

Macro \texttt{\textbackslash mleft\textbackslash right\textbackslash restore} restores \texttt{\textbackslash left} and \texttt{\textbackslash right} with the original meaning if they were previously redefined by \texttt{\textbackslash mleft\textbackslash right} (also locally).

2 Implementation

1 (*package)*

Reload check, especially if the package is not used with \texttt{\L\TeX}.

2 \texttt{\begingroup\catcode61\catcode48\catcode32=10\relax\%
\catcode13=5 \catcode35=6 \catcode39=12 \catcode44=12 \catcode45=12 \catcode46=12 \catcode58=12 \catcode64=11 \catcode123=1 \catcode125=2 \%
\expandafter\let\expandafter\x\csname ver@mleftright.sty\endcsname ver@mleftright.sty\endlinechar=13 \%
15 /ifs/x/relax \%
plain-\TeX, first loading

2
\begin{verse}
\begin{verbatim}
\def\empty{}
\ifx\x\empty % LaTeX, first loading,
\% variable is initialized, but \ProvidesPackage not yet seen
\else
\expandafter\ifx\csname PackageInfo\endcsname\relax
\def\x#1#2{\immediate\write-1{Package #1 Info: #2, stopped}}%
\else
\def\x#1#2{\PackageInfo{#1}{#2, stopped}}%
\fi
\x{mleftright}{The package is already loaded}%
\endinput
\fi
\fi
\endgroup%
Package identification:
\begingroup\catcode61\catcode48\catcode32=10\relax%
\catcode13=5 % ^^M
\endlinechar=13 %
\catcode35=6 % #
\catcode39=12 % '
\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\[{#3}\]{\endgroup
\immediate\write-1{Package: #3 #4}%
\xdef#1{#4}%
}\else
\def\x#1\[{#3}\]{\endgroup
#2\[{#3}\]%
\ifx#1\@undefined
\xdef#1{#3}%
\fi
\ifx#1\relax
\xdef#1{#3}%
\fi
}\fi
\expandafter\x\csname ver@mleftright.sty\endcsname
\ProvidesPackage{mleftright}[2016/05/16 v1.1 Math left/right delim. as open/close (HO)]%
\endgroup\catcode61\catcode48\catcode32=10\relax%
\catcode13=5 % ^^M
\endlinechar=13 %
\catcode123=1 % {
\catcode125=2 % }
\end{verbatim}
\end{verse}
The original commands \left and \right are saved and later used in \mleft and \mright in order to deal with:

\let\left\mleft
\let\right\mright
Macro \mleft@Def defines a macro as robust macro if \( \varepsilon \)-\TeX{} or \( \LaTeX{} \) is available.

\begin{verbatim}
130 \ltx@ifundefined{protected}{%
131 \ltx@ifundefined{DeclareRobustCommand}{%
132 \def\mleft@Def{\def}%
133 }{%
134 \def\mleft@Def{\DeclareRobustCommand*}%
135 }%
136 }{%
137 \def\mleft@Def{\protected\def}%
138 }
139 \edef\mleft@Def#1{%
140 \noexpand\ltx@ifundefined{%
141 \noexpand\expandafter\noexpand\ltx@gobble\noexpand\string#1%
142 }{%
143 \expandafter\noexpand\mleft@Def#1%
144 }{%
145 \noexpand\@PackageError{mleft}{Command \noexpand\string#1 already defined}%
146 }\noexpand\@ehd
147 \noexpand\ltx@gobble
148 }%
149 }

In case of \( \varepsilon \)-\TeX{} the group status after the left symbol is saved and later checked at the beginning of \mright{}.

\begin{verbatim}
151 \ltx@ifundefined{currentgrouplevel}{%
152 \catcode38=14 \% & = comment
153 }{%
154 \catcode38=9 \% & = ignore
155 }

\mleft@GroupLevel
156 & \def\mleft@GroupLevel{-1}%

\mleft@WrongGroup
157 & \def\mleft@WrongGroup#1(#2){%
158 & \ifnum\mleft@GroupLevel<\ltx@zero
159 & \@PackageError{mleft}{Missing previous \string\mleft}%
160 & \else
161 & \@ehc
162 & \else
163 & \@PackageError{mleft}{%}
164 & \Unexpected group status for \string\mright{}%
165 & \ifnum\mleft@GroupLevel=#1%
166 & \else
167 & \MessageBreak
168 & \Group level is #1, %
169 & \expected is \mleft@GroupLevel
170 & \fi
171 & \ifnum16=#2 %
172 & \else
173 & \MessageBreak
174 & \Group type is #2 (%
175 & \ifcase#2%
176 & \bottom level%
177 & \expandafter\expandafter\expandafter\ltx@gobblefour
178 & \expandafter\ltx@gobbletwo
179 & \or simple%
180 & \or hbox%
181 & \or adjusted hbox%
182 & \or vbox%
\end{verbatim}

5
3 Test

3.1 Catcode checks for loading

\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\if\csname loop\endcsname\relax
\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@elax
}%
\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
}
\def\RangeCatcodeCheck#1#2#3{%
4 Installation

4.1 Download

Package. This package is available on CTAN:\footnote{\url{http://ctan.org/pkg/mleftright}}:

\texttt{CTAN:macros/latex/contrib/oberdiek/mleftright.dtx} The source file.

\texttt{CTAN:macros/latex/contrib/oberdiek/mleftright.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.

\texttt{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.

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 mleftright.dtx

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

    mleftright.sty         \rightarrow tex/generic/oberdiek/mleftright.sty
    mleftright.pdf         \rightarrow doc/latex/oberdiek/mleftright.pdf
    test/mleftright-test1.tex \rightarrow doc/latex/oberdiek/test/mleftright-test1.tex
    mleftright.dtx         \rightarrow source/latex/oberdiek/mleftright.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 (\TeX, \miktex, ...) relies on file name databases, you must refresh these. For example, \TeX\ users run texhash or mktexlar.

4.5 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{mleftright.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 mleftright.dtx
makeindex -s gind.ist mleftright.idx
pdflatex mleftright.dtx
makeindex -s gind.ist mleftright.idx
pdflatex mleftright.dtx
```

5 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 mleftright.xml.

```
<entry datestamp='$Date$' modifier='$Author$' id='mleftright'>
  <name>mleftright</name>
  <caption>Variants of delimiters that act as maths open/close.</caption>
  <authorref id='auth:oberdiek'/>
  <copyright owner='Heiko Oberdiek' year='2010'/>
  <license type='lppl1.3'/>
  <version number='1.1'/>
  <description>
    The package defines variants \texttt{\mleft} and \texttt{\mright} of \texttt{\left} and \texttt{\right}, that make the delimiters act as \texttt{\mathopen} and \texttt{\mathclose}. These commands address spacing difficulties in subformulas.\par
    The package is part of the \texttt{oberdiek} bundle.\par
  </description>
  <documentation details='Package documentation' href='ctan:/macros/latex/contrib/oberdiek/mleftright.pdf'/>
  <ctan file='true' path='/macros/latex/contrib/oberdiek/mleftright.dtx'/>
  <miktex location='oberdiek'/>
  <texlive location='oberdiek'/>
  <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip'/>
</entry>
```

6 Acknowledgement

Donald Arsenau: He provided the main trick and the first macros.

Philipp Stephani: He solved the subscript problem.

7 References

[1] Dave94705, spacing after \right and before \left, newsgroup comp.text.tex, Message-ID: 5d264909-7c3d-4c9d-9b22-434178b2bf0@g21g2000prn.googlegroups.com, 2010-08-12. http://groups.google.com/group/comp.text.tex/msg/e5b6833da7dc29bf
8 History

[2010/09/25 v1.0]

- The first version.

[2016/05/16 v1.1]

- Documentation updates.

9 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.

| Symbols | \# | \% | @ | \@PackageError | \@ehc | \@ehd | \@firstofone | \@gobble | \@undefined | \\ | \{ | \}
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