The enparen package

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Abstract

The package defines macros to set parentheses that automatically change the symbols from inner to outer fences.

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

1 Documentation

The LATEX package provides macros for automatically changed parentheses symbols depending on the fence order. The innermost parentheses are always using the same parentheses. The symbols changes for the outer fences.

Example:

```
{a (b) [c (d)] (e)}
```

is generated by

\documentclass{article}
\usepackage{enparen}
\begin{document}
 \enparen{a \enparen{b} \enparen{c \enparen{d}} \enparen{e}}
\end{document}

The package is the result of a newsgroup thread. Dan gives the following specification [1]:

"On the other hand, the rules for fences are usually the reverse: innermost fences are always (), next outer are [], etc. This means the opening fence has to wait until all the fences between it and the matching close have been detected before it can decide whether to be (or [or {."

The fence level counting starts from innermost parentheses with one. For the next outer fences the level is increased by one. The example above with level indexes:

```
{a (_1b)_1 [_2c (_1d)_1]_2 (e)}_3
```

The correct level is only known at the closing symbol. Therefore the correct value is remembered in the main .aux file and used in the second LATEX run.

1.1 User macros

```
\enparen \{\langle text \rangle\}
```

The macro \enparen puts its argument $\langle text \rangle$ in parentheses. If the macro is nested, the used fence symbols change for the outer fences.

\enparenLeft \enparenRight

Instead of \enparen{text} the left and right symbol can be used separately, but in pairs:

\enparenLeft text\enparenRight

\enparenLeft and \enparenRight may be used at different group levels, but they must be properly nested.

```
\enparenSetSymbols \{\langle level \rangle\}\ \{\langle opening\ symbol \rangle\}\ \{\langle closing\ symbol \rangle\}
```

Macro \enparenSetSymbols configures the $\langle opening\ symbol \rangle$ and $\langle closing\ symbol \rangle$ for the $\langle level \rangle$. The $\langle level \rangle$ is a number and the counting starts with one. Level zero is used, if the correct level is not known (e.g. in the first IATEX run). The package defines the following sets:

```
\enparenSetSymbols{0}{()}{()}
\enparenSetSymbols{1}{()}{()}
\enparenSetSymbols{2}{[]}{()}
\enparenSetSymbols{3}{\{}{\}}
```

Example for changing the third and adding a fourth level:

```
\label{langle} $$\operatorname{Symbols}(3)_{\ngle}} \le \operatorname{Symbols}(4)_{\label{langle}} $$\operatorname{Symbols}(4)_{\label{langle}}.
```

```
\enparenUnsetSymbols \{\langle level \rangle\}
```

The symbols for level $\langle level \rangle$ are removed. Example scenario: Only two nesting levels must be used, the package defines more, then the third level can be disabled by $\ensuremath{\verb|ensuremath|}$ and the user gets warnings if parentheses at level 3 are needed.

1.2 Contexts

```
\enparenBeginContext \{\langle name \rangle\}
\enparenEndContext \{\langle name \rangle\}
```

If the current text is interrupted by footnotes, floats with captions, then the parentheses inside the text of footnotes, captions, ...should restart from scratch. This can be achieved by embedding the text inside macros \enparenBeginContext and \enparenEndContext. These macros must be properly nested. The $\langle name \rangle$ for the begin and end macro must be the same. It is a help for debugging problems, because the warning messages show the context name. But it is not necessary that the begin/end pairs have different names. Example:

```
\enparenLeft text before table ...
\begin{table}
  \caption{Table caption}
  \enparenBegin{Context}{table}
  Other text \enparen{foobar}.
  \enparenEnd{Context}{table}
\end{table}
text after table ...
\enparenRight
```

The parentheses inside the table environment and context 'table' are not nested inside other parentheses: (foobar). In case of captions and footnotes the contexts are automatically added, see next section about options.

1.3 Options

```
\enparenSetup \{\langle key \ value \ list \rangle\}
```

Some options (currently all) can also be set after the package is loaded. They can be set in the argument $\langle key\ value\ list \rangle$ of \enparenSetup. Options are disabled after they are used the last time. Currently all options are boolean options and are disabled in \begin{document}.

caption: The caption text is put in a context caption.

footnote: The footnote text is put in a context footnote.

Example for disabling the two options at different places:

```
\usepackage[caption=false]{enparen}
\enparenSetup{footnote=false}
```

1.4 Notes

Implicite kerning: Unexpandable stuff might affect the implicite kerning. The package cannot avoid this, because it need to define and redefine macros at the occurrence of each symbol. This is done before the opening and after the closing symbol, thus that the implicite kerning inside is not affected.

2 Implementation

```
1 (*package)
 2 \NeedsTeXFormat{LaTeX2e}
 3 \ProvidesPackage{enparen}
   [2016/05/16 v1.1 Parentheses nesting (HO)]%
2.1
      Resources
 5 \RequirePackage{ltxcmds}[2011/11/09]
 6 \ltx@IfUndefined{numexpr}{%
    \PackageError{enparen}{%
     Missing e-TeX's \ltx@backslashchar numexpr.\MessageBreak
 8
     The package will continue with emergency definitions%
10
    }\@ehc
11
    \def\enparenLeft{(}%
12
    \def\enparenRight{)}%
13 \long\def\enparen#1{\enparenLeft#1\enparenRight}%
14 \let\enparenSetup\ltx@gobble
15 \let\enparenSetSymbols\ltx@gobblethree
16 \let\enparenUnsetSymbols\ltx@gobble
17 \endinput
18 }{}
19 \RequirePackage{protecteddef}[2011/01/31]
20 \RequirePackage{atveryend}[2011/06/30]
21 \RequirePackage{uniquecounter}[2011/01/30]
22 \RequirePackage{zref-base}[2011/03/18]
23 \RequirePackage{kvoptions}[2011/06/30]
24 \RequirePackage{kvsetkeys}[2011/10/18]
25 \providecommand{\zref@wrapper@mainaux}[1]{\%
    \ifx\@auxout\@mainaux
26
     #1%
27
    \else
28
29
     \begingroup
       \let\@auxout\@mainaux
30
       #1%
31
32
      \endgroup
    \fi
33
34 }
35 \UniqueCounterNew{enparen}
36 \zref@newprop{enparen}[0]{}
      Contexts
```

2.2

\zref@wrapper@mainaux

```
\enparenContextDefault
                         37 \def\enparenContextDefault{main}
          \enparen@ctx
                         38 \let\enparen@ctx\ltx@empty
        \enparen@stack
                         39 \let\enparen@stack\ltx@empty
```

2.2.1 Stack for contexts

```
\enparen@CtxStack
```

40 \global\let\enparen@CtxStack\ltx@empty

```
\enparen@CtxStackPush
```

```
41 \def\enparen@CtxStackPush#1{%
42 \xdef\enparen@CtxStack{%
43 {\enparen@ctx}{\enparen@stack}%
44 \enparen@CtxStack
45 }%
46 \xdef\enparen@ctx{#1}%
47 \global\let\enparen@stack\ltx@empty
48 }
```

\enparen@CtxStackPop

```
49 \def\enparen@CtxStackPop{%
   \verb|\ifx\enparen@CtxStack|| tx@empty |
     \PackageWarning{enparen}{%
51
      Pop request for empty context stack%
52
53
     \global\let\enparen@ctx\enparenContextDefault
54
     \global\let\enparen@stack\ltx@empty
55
   \else
56
     \xdef\enparen@ctx{%
57
      \expandafter\ltx@car\enparen@CtxStack\@nil
58
59
     \xdef\enparen@stack{%
60
61
       \expandafter\ltx@carsecond\enparen@CtxStack\@nil
62
     \xdef\enparen@CtxStack{%
63
      \expandafter\ltx@cdrtwo\enparen@CtxStack\@nil
64
     }%
65
66
   \fi
67 }
```

2.2.2 Context user macros

$\verb|\enparenBeginContext|$

```
68 \ProtectedDef*{\enparenBeginContext}[1]{%
69 \enparen@CtxStackPush{#1}%
70 }
```

\enparenEndContext

```
71 \ProtectedDef*{\enparenEndContext}[1]{%
   \edef\enparen@temp{#1}%
72
   \ifx\enparen@temp\enparen@ctx
73
74
75
     \PackageWarning{enparen}{%
76
      Context mismatch in end request.\MessageBreak
77
      `#1' should be ended, but current context\MessageBreak
      is `\enparen@ctx'%
78
79
    ት%
   \fi
80
   \enparenCheckEmptyStack
81
   \enparen@CtxStackPop
82
83 }
```

$\verb|\enparenCheckEmptyStack||$

```
84 \ProtectedDef*{\enparenCheckEmptyStack}[0]{\%}
```

- 86 \else

```
\PackageWarning{enparen}{%
                          87
                                 Ending non-empty stack `\enparen@ctx':\MessageBreak
                          88
                                 \enparen@PrintStack\MessageBreak
                          89
                          90
                          91
                              \fi
                          92 }
   \enparen@PrintStack
                          93 \def\enparen@PrintStack{%
                              \expandafter\enparen@PrintStackAux
                              \verb|\enparen@stack|| tx@empty|| ltx@empty||
                          96 }
\enparen@PrintStackAux
                          97 \def\enparen@PrintStackAux#1#2{%
                              \int \int dx = 1\%
                          98
                          99
                              \else
                          100
                                {#1:#2}%
                                \expandafter\enparen@PrintStackAux
                          102 \fi
                         103 }
                                Symbols
                          2.3
    \enparenSetSymbols
                         104 \ProtectedDef*{\enparenSetSymbols}[3]{\%}
                         105 \expandafter
                          106 \quad \texttt{\def\csname enparen@symbol\the\numexpr\#1L\endcsname} \{ \#2 \} \%
                          107 \expandafter
                          108 \def\csname enparen@symbol\the\numexpr#1R\endcsname{#3}%
                         109 }
 \enparenUnsetSymbols
                         110 \ProtectedDef*{\enparenUnsetSymbols}[1]{\%}
                         111 \expandafter
                         112 \let\csname enparen@symbol\the\numexpr#1L\endcsname\ltx@undefined
                         {\tt 114} \quad \verb|\etcsname| enparen@symbol\\ the \verb|\numexpr#1R| endcsname\\ \verb|\ltx@undefined| \\
                         115 }
                          116 \enparenSetSymbols{0}{(){)}
                          117 \enparenSetSymbols{1}{(){)}
                          118 \verb|\enparenSetSymbols{2}{[]}{]}
                          119 \enparenSetSymbols\{3\}\{\\{\}\}\}
                         120 \ensuremath{\ngle}} \ensuremath{\ngle}} \ensuremath{\ngle}}
                         2.4 Main user macros
               \enparen
                         121 \ProtectedDef{\enparen}[1]{%
                         122 \enparenLeft#1\enparenRight
                         123 }
           \enparenLeft
                         124 \ProtectedDef*{\enparenLeft}[0]{%
                         125 \UniqueCounterCall{enparen}\enparen@Left
                         126 }
          \enparen@Left
                          127 \def\enparen@Left#1{\%
                         128 \xdef\enparen@stack{%
```

```
{#1}{1}%
                129
                      \expandafter\enparen@Inc\expandafter2\expandafter!%
                130
                      \enparen@stack\ltx@empty\ltx@empty
                131
                132
                133
                    \edef\enparen@tmp{\zref@extract{enparen#1}{enparen}}%
                134
                    135
                      \PackageWarning{enparen}{%
                136
                       Undefined symbols for level \enparen@tmp
                     }%
                137
                     \csname enparen@symbol0L\endcsname
                138
                    }{%
                139
                      \csname enparen@symbol\enparen@tmp L\endcsname
                140
                141
                    }%
                142 }
  \enparen@Inc
                143 \def\enparen@Inc#1!#2#3{\%
                    \t \sum_{x \in \mathbb{Z}} 1
                144
                    \else
                145
                      \ifnum#3<#1 %
                146
                       {#2}{#1}%
                147
                       \expandafter\enparen@Inc
                148
                149
                       \the\numexpr#1+1\expandafter\expandafter\expandafter!%
                150
                151
                       {#2}{#3}%
                      \fi
                152
                153
                    \fi
                154 }
 \enparenRight
                155 \ProtectedDef*{\enparenRight}[0]{%
                    \ifx\enparen@stack\ltx@empty
                157
                      \PackageWarning{enparen}{%
                       Missing left symbol for right symbol%
                158
                     }%
                159
                      \csname enparen@symbol0R\endcsname
                160
                161
                    \else
                      \expandafter\enparen@Right\enparen@stack\@nil
                162
                    \fi
                163
                164 }
\enparen@Right
                165 \def\enparen@Right#1#2#3\@nil{%
                    \ltx@IfUndefined{%
                166
                167
                      enparen@symbol%
                      \zref@extract{enparen#1}{enparen}%
                168
                     R%
                169
                170
                    }{%
                171
                      \csname enparen@symbol0R\endcsname
                172
                    }{%
                173
                     \csname
                       enparen@symbol%
                174
                       \zref@extract{enparen#1}{enparen}%
                175
                       R%
                176
                      \endcsname
                177
                178
                    \zref@wrapper@mainaux{%
                179
                     \zref@setcurrent{enparen}{#2}%
                180
                181
                     \zref@labelbyprops{enparen#1}{enparen}%
                182 }%
                    \xdef\ence{#3}%
                183
                184 }
```

2.5 Options

```
185 \SetupKeyvalOptions{%
186 family=enparen,%
187 prefix=enparen@,%
188 }
\enparenSetup

189 \ProtectedDef*{\enparenSetup}[0]{%
190 \kvsetkeys{enparen}%
191 }

192 \DeclareBoolOption[true]{footnote}
193 \DeclareBoolOption[true]{caption}
194 \ProcessKeyvalOptions*
```

2.6 Context settings

\enparen@AtBegin

```
195 \def\enparen@AtBegin{%
    \ifenparen@footnote
     197
     198
      \verb|\enparen@org@makefntext{||}|
199
        \enparenBeginContext{footnote}%
200
        ##1%
201
        \enparenEndContext{footnote}%
202
203
      }%
204
     }%
205
    \enparen@Disable{footnote}%
206
207
    \ifenparen@caption
     \let\enparen@org@makecaption\@makecaption
208
     \long\def\@makecaption##1##2{\%}
209
       \enparen@org@makecaption{##1}{%
210
        \enparenBeginContext{caption}%
211
        ##2%
212
        \enparenEndContext{caption}%
213
      }%
214
     }%
215
216
    \fi
217
    \enparen@Disable{caption}%
218 }
219 \def\enparen@Disable#1{%
    \DisableKeyvalOption[%
221
     action=warning,%
     package=enparen,%
222
223 ]{enparen}{#1}%
```

2.7 At end of document

225 \AtBeginDocument{\enparen@AtBegin}

\enparen@AtEnd

224 }

\enparen@Disable

```
226 \def\enparen@AtEnd{%
227 \enparenCheckEmptyStack
228 \ifx\enparen@CtxStack\ltx@empty
229 \else
230 \PackageWarningNoLine{enparen}{%
231 Context stack is not empty at end of document.\MessageBreak
```

```
Current stack and contents of context stack:\MessageBreak
[\enparen@ctx]:[\enparen@PrintStack]%

\expandafter
\enparen@PrintContextStack\enparen@CtxStack\relax\relax
\expandafter
\fi
\fi
238 \}
```

\enparen@PrintContextStack

```
239 \def\enparen@PrintContextStack#1#2{%
240 \ifx\relax#1\ltx@empty
241 \else
242 \MessageBreak
243 [#1]:[\enparen@PrintStackAux#2\ltx@empty\ltx@empty]% hash-ok
244 \expandafter\enparen@PrintContextStack
245 \fi
246 }
247 \AtVeryEndDocument{\enparen@AtEnd}
248 \/package\
```

3 Installation

3.1 Download

Package. This package is available on CTAN¹:

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

CTAN:macros/latex/contrib/oberdiek/enparen.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):

```
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:

 ${\tt tex\ enparen.dtx}$

¹http://ctan.org/pkg/enparen

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

```
enparen.sty \rightarrow tex/latex/oberdiek/enparen.sty enparen.pdf \rightarrow doc/latex/oberdiek/enparen.pdf enparen.dtx \rightarrow source/latex/oberdiek/enparen.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 IATEX. 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{enparen.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 pdfIATEX:

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

4 References

[1] Dan Luecking: Re: bracket order; newsgroup comp.text.tex; message id (9b07c9c8-ff92-4cbf-b3a9-84efecfeb506@l24g2000yqm.googlegroups.com) 2012-01-05.

http://groups.google.com/group/comp.text.tex/msg/8774519da31c2352

5 History

[2012/01/07 v1.0]

• First version.

[2016/05/16 v1.1]

• 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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