

The enparen package

Heiko Oberdiek
<heiko.oberdiek at gmail.com>

2012/01/07 v1.0

Abstract

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

Contents

1	Documentation	2
1.1	User macros	2
1.2	Contexts	3
1.3	Options	3
1.4	Notes	4
2	Implementation	4
2.1	Resources	4
2.2	Contexts	5
2.2.1	Stack for contexts	5
2.2.2	Context user macros	5
2.3	Symbols	6
2.4	Main user macros	7
2.5	Options	8
2.6	Context settings	8
2.7	At end of document	9
3	Installation	10
3.1	Download	10
3.2	Bundle installation	10
3.3	Package installation	10
3.4	Refresh file name databases	10
3.5	Some details for the interested	11
4	References	11
5	History	11
	[2012/01/07 v1.0]	11
6	Index	11

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:

$\{_3a (_1b)_1 [_2c (_1d)_1]_2 (e)\}_3$

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 L^AT_EX 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:

```
\enparenSetSymbols{3}{\ensuremath{\langle \rangle}}{\ensuremath{\langle \rangle}}
\enparenSetSymbols{4}{\{ }\{ }\}
```

`\enparenUnsetSymbols {<level>}`

The symbols for level *<level>* are removed. Example scenario: Only two nesting levels must be used, the package defines more, then the third level can be disabled by `\enparenUnsetSymbols{3}` and the user gets warnings if parentheses at level 3 are needed.

1.2 Contexts

`\enparenBeginContext {<name>}`
`\enparenEndContext {<name>}`

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 *<name>* 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 {<key value list>}`

Some options (currently all) can also be set after the package is loaded. They can be set in the argument *<key value list>* 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 occurence 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}  
4 [2012/01/07 v1.0 Parentheses nesting (HO)]%
```

2.1 Resources

```
5 \RequirePackage{ltxcmds}[2011/11/09]  
6 \ltx@ifundefined{numexpr}{%  
7   \PackageError{enparen}{%  
8     Missing e-TeX's \ltx@backslashchar numexpr.\MessageBreak  
9     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]
```

`\zref@wrapper@mainaux`

```
25 \providecommand{\zref@wrapper@mainaux}[1]{%  
26   \ifx\@auxout\@mainaux  
27     #1%  
28   \else  
29     \begingroup  
30       \let\@auxout\@mainaux  
31       #1%  
32     \endgroup  
33   \fi  
34 }
```



```

35 \UniqueCounterNew{enparen}
36 \zref@newprop{enparen}[0]{}
```

2.2 Contexts

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

2.2.2 Context user macros

\enparenBeginContext

```

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


`\enparenEndContext`

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

`\enparenCheckEmptyStack`

```
84 \ProtectedDef*{\enparenCheckEmptyStack}[0]{%
85   \ifx\enparen@stack\ltx@empty
86   \else
87     \PackageWarning{enparen}{%
88       Ending non-empty stack ‘\enparen@ctx’:\MessageBreak
89       \enparen@PrintStack\MessageBreak
90     }%
91   \fi
92 }
```

`\enparen@PrintStack`

```
93 \def\enparen@PrintStack{%
94   \expandafter\enparen@PrintStackAux
95   \enparen@stack\ltx@empty\ltx@empty
96 }
```

`\enparen@PrintStackAux`

```
97 \def\enparen@PrintStackAux#1#2{%
98   \ifx\ltx@empty#1%
99   \else
100     {#1:#2}%
101     \expandafter\enparen@PrintStackAux
102   \fi
103 }
```

2.3 Symbols

`\enparenSetSymbols`

```
104 \ProtectedDef*{\enparenSetSymbols}[3]{%
105   \expandafter
106   \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
113   \expandafter
114   \let\csname enparen@symbol\the\numexpr#1R\endcsname\ltx@undefined
115 }
```



```

116 \enparenSetSymbols{0}{\{ \}}
117 \enparenSetSymbols{1}{\{ \}}
118 \enparenSetSymbols{2}{\{ \}}
119 \enparenSetSymbols{3}{\{ \}}
120 \enparenSetSymbols{4}{\ensuremath{\angle}}{\ensuremath{\angle}}

```

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{%
129     {#1}{1}%
130     \expandafter\enparen@Inc\expandafter2\expandafter!%
131     \enparen@stack\ltx@empty\ltx@empty
132   }%
133   \edef\enparen@tmp{\zref@extract{enparen#1}{enparen}}%
134   \ltx@ifundefined{enparen@symbol\enparen@tmp L}{%
135     \PackageWarning{enparen}{%
136       Undefined symbols for level \enparen@tmp
137     }%
138     \csname enparen@symbol0L\endcsname
139   }{%
140     \csname enparen@symbol\enparen@tmp L\endcsname
141   }%
142 }

\enparen@Inc
143 \def\enparen@Inc#1!#2#3{%
144   \ifx\ltx@empty#2%
145   \else
146     \ifnum#3<#1 %
147       {#2}{#1}%
148       \expandafter\enparen@Inc
149       \the\numexpr#1+1\expandafter\expandafter\expandafter!%
150     \else
151       {#2}{#3}%
152     \fi
153   \fi
154 }

\enparenRight
155 \ProtectedDef*{\enparenRight}[0]{%
156   \ifx\enparen@stack\ltx@empty
157     \PackageWarning{enparen}{%
158       Missing left symbol for right symbol%
159     }%
160     \csname enparen@symbol0R\endcsname

```



```

161 \else
162   \expandafter\enparen@Right\enparen@stack\@nil
163 \fi
164 }

```

\enparen@Right

```

165 \def\enparen@Right#1#2#3\@nil{%
166   \ltx@ifundefined{%
167     enparen@symbol%
168     \zref@extract{enparen#1}{enparen}%
169     R%
170   }{%
171     \csname enparen@symbol0R\endcsname
172   }{%
173     \csname
174       enparen@symbol%
175       \zref@extract{enparen#1}{enparen}%
176       R%
177     \endcsname
178   }%
179   \zref@wrapper@mainaux{%
180     \zref@setcurrent{enparen}{#2}%
181     \zref@labelbyprops{enparen#1}{enparen}%
182   }%
183   \xdef\enparen@stack{#3}%
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{%
196   \ifenparen@footnote
197     \let\enparen@org@makefntext\@makefntext
198     \long\def\@makefntext##1{%
199       \enparen@org@makefntext{%
200         \enparenBeginContext{footnote}%
201         ##1%
202         \enparenEndContext{footnote}%
203       }%
204     }%
205   \fi
206   \enparen@Disable{footnote}%

```



```

207 \ifenparen@caption
208 \let\enparen@org@makecaption\@makecaption
209 \long\def\@makecaption##1##2{%
210 \enparen@org@makecaption{##1}{%
211 \enparenBeginContext{caption}%
212 ##2%
213 \enparenEndContext{caption}%
214 }%
215 }%
216 \fi
217 \enparen@Disable{caption}%
218 }

```

\enparen@Disable

```

219 \def\enparen@Disable#1{%
220 \DisableKeyvalOption[%
221 action=warning,%
222 package=enparen,%
223 ]{enparen}{#1}%
224 }

225 \AtBeginDocument{\enparen@AtBegin}

```

2.7 At end of document

\enparen@AtEnd

```

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
232 Current stack and contents of context stack:\MessageBreak
233 [\enparen@ctx]:[\enparen@PrintStack]%
234 \expandafter
235 \enparen@PrintContextStack\enparen@CtxStack\relax\relax
236 }%
237 \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 T_EX 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 T_EX:

```
tex enparen.dtx
```

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

```
enparen.sty → tex/latex/oberdiek/enparen.sty
enparen.pdf → doc/latex/oberdiek/enparen.pdf
enparen.dtx → 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 T_EX distribution (teT_EX, miK_TE_X, ...) relies on file name databases, you must refresh these. For example, teT_EX users run `texhash` or `mktextlsr`.

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

3.5 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 enparen.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{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 `pdf \LaTeX` :

```
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@124g2000yqm.googlegroups.com>` 2012-01-05. <http://groups.google.com/group/comp.text.tex/msg/8774519da31c2352>

5 History

[2012/01/07 v1.0]

- First 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; plain numbers refer to the code lines where the entry is used.

Symbols	<code>\@ehc</code>	10
<code>\@auxout</code>		26, 30

\@mainaux	26, 30	\ifnparen@footnote	196
\@makecaption	208, 209	\ifnum	146
\@makefntext	197, 198	\ifx	26, 50, 73, 85, 98, 144, 156, 228, 240
\@nil	58, 61, 64, 162, 165		
\{	119	K	
\}	119	\kvsetkeys	190
		L	
A		\langle	120
\AtBeginDocument	225	\ltx@backslashchar	8
\AtVeryEndDocument	247	\ltx@car	58
		\ltx@carsecond	61
C		\ltx@cdrtwo	64
\csname	106, 108, 112, 114, 138, 140, 160, 171, 173	\ltx@empty	38, 39, 40, 47, 50, 55, 85, 95, 98, 131, 144, 156, 228, 240, 243
		\ltx@gobble	14, 16
D		\ltx@gobblethree	15
\DeclareBoolOption	192, 193	\ltx@ifundefined	6, 134, 166
\DisableKeyvalOption	220	\ltx@undefined	112, 114
		M	
E		\MessageBreak	8, 76, 77, 88, 89, 231, 232, 242
\endcsname	106, 108, 112, 114, 138, 140, 160, 171, 177		
\endinput	17	N	
\enparen	2, 13, 121	\NeedsTeXFormat	2
\enparen@AtBegin	195, 225	\numexpr	106, 108, 112, 114, 149
\enparen@AtEnd	226, 247		
\enparen@ctx	38, 43, 46, 54, 57, 73, 78, 88, 233	P	
\enparen@CtxStack	40, 42, 44, 50, 58, 61, 63, 64, 228, 235	\PackageError	7
\enparen@CtxStackPop	49, 82	\PackageWarning	51, 75, 87, 135, 157
\enparen@CtxStackPush	41, 69	\PackageWarningNoLine	230
\enparen@Disable	206, 217, 219	\ProcessKeyvalOptions	194
\enparen@Inc	130, 143	\ProtectedDef	68, 71, 84, 104, 110, 121, 124, 155, 189
\enparen@Left	125, 127	\providecommand	25
\enparen@org@makecaption	208, 210	\ProvidesPackage	3
\enparen@org@makefntext	197, 199		
\enparen@PrintContextStack	235, 239	R	
\enparen@PrintStack	89, 93, 233	\rangle	120
\enparen@PrintStackAux	94, 97, 243	\RequirePackage	5, 19, 20, 21, 22, 23, 24
\enparen@Right	162, 165		
\enparen@stack	39, 43, 47, 55, 60, 85, 95, 128, 131, 156, 162, 183	S	
\enparen@temp	72, 73	\SetupKeyvalOptions	185
\enparen@tmp	133, 134, 136, 140		
\enparenBeginContext	3, 68, 200, 211	T	
\enparenCheckEmptyStack	81, 84, 227	\the	106, 108, 112, 114, 149
\enparenContextDefault	37, 54		
\enparenEndContext	71, 202, 213	U	
\enparenLeft	2, 11, 13, 122, 124	\UniqueCounterCall	125
\enparenRight	12, 13, 122, 155	\UniqueCounterNew	35
\enparenSetSymbols	2, 15, 104, 116, 117, 118, 119, 120		
\enparenSetup	3, 14, 189	Z	
\enparenUnsetSymbols	3, 16, 110	\zref@extract	133, 168, 175
\ensuremath	120	\zref@labelbyprops	181
		\zref@newprop	36
I		\zref@setcurrent	180
\ifnparen@caption	207	\zref@wrapper@mainaux	25, 179