The Ragged2e-package∗

Martin Schröder
Crüsemannallee 3
D-28213 Bremen
Martin.Schroeder@ACM.org
PGP-Key: 2048 bit / KeyID 292814E5
7E36 6EC8 97FA 2995 82C3 FEA5 2719 090E

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Abstract

This package provides new commands and environments for setting ragged text which are easy to configure to allow hyphenation. An earlier attempt to do this was the style \raggedright[6] by the same author.

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1 The problem

\LaTeX{} has three commands (\centering, \raggedleft,
are based upon the commands (center uses \texttt{\centering}, flushleft \texttt{\raggedright}, and flushright \texttt{\raggedleft}).

These commands have, however, one serious flaw: they render hyphenation almost impossible, and thus the text looks too ragged, as the following example shows:

\begin{center}
\texttt{\textbf{\raggedright}}: "The L\LaTeX\ document preparation system is a special version of Donald Knuth's \TeX\ program. \TeX\ is a sophisticated program designed to produce high-quality typesetting, especially for mathematical text." [3, p. xiii]
\end{center}

\begin{center}
\texttt{\textbf{\RaggedRight}}: "The L\LaTeX\ document preparation system is a special version of Donald Knuth's \TeX\ program. \TeX\ is a sophisticated program designed to produce high-quality typesetting, especially for mathematical text." [3, p. xiii]
\end{center}

Thus the \texttt{\rightskip} is set to \texttt{Opt plus 1fil}. Knuth, however warns [2, p. 101]:

“For example, a person can set \texttt{\rightskip=Opt plus 1fil}, and every line will be filled with space to the right. But this isn't a particularly good way to make ragged-right margins, because the infinite stretchability will assign zero badness to lines that are very short. To do a decent job of ragged-right setting, the trick is to set \texttt{\rightskip} so that it will stretch enough to make line breaks possible, yet not too much, because short lines should be considered bad. Furthermore the spaces between words should be fixed so that they do not stretch or shrink.”

2.2 plain

\LaTeX\ defines an special version of \texttt{\raggedright}, which operates the way Knuth describes it; but which can not be used with \LaTeX, because \LaTeX\ redefines \texttt{\raggedright}.

\begin{verbatim}
\def\raggedright{%
  \rightskip\z@ plus2em
  \spaceskip.3333em
  \xspaceskip.5em\relax}
\end{verbatim}

\LaTeX\ provides also a version of \texttt{\raggedright} for typewriter fonts

\begin{verbatim}
\def\ttraggedright{%
  \tt\rightskip\z@ plus2em\relax}
\end{verbatim}
3 Our solution

3.1 Usage

Since the plain solution can not be used with \LaTeX, we have to redefine it and make it possible to configure it for personal preferences.

3.1.1 The macros

\Centering, \RaggedLeft, and \RaggedRight can be used in the same way as \centering, \raggedleft, and \raggedright: Just type the command, and after that the whole text will be set centered, ragged-left or ragged-right.

For example, we switched on \RaggedRight on the top of this text, and consequently this text was set ragged-right.

The new commands are fully compatible with their counterparts in \LaTeX, but implement the plain solution and can be easily configured using the following parameters:

3.1.2 The parameters

<table>
<thead>
<tr>
<th>Command</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>\Centering</td>
<td>\CenteringLeftSkip, \CenteringRightSkip, \CenteringParfillskip, \CenteringParIndent</td>
</tr>
<tr>
<td>\RaggedLeft</td>
<td>\RaggedLeftLeftskip, \RaggedLeftRightskip, \RaggedLeftParfillskip, \RaggedLeftParIndent</td>
</tr>
<tr>
<td>\RaggedRight</td>
<td>\RaggedRightLeftskip, \RaggedRightRightskip, \RaggedRightParfillskip, \RaggedRightParIndent</td>
</tr>
<tr>
<td>all</td>
<td>\RaggedSpaceskip, \RaggedXSpaceskip</td>
</tr>
</tbody>
</table>

All Parameters can be set with \setlength, e.g.

\setlength{RaggedRightRightskip}{Opt plus 1em}

sets \RaggedRightRightskip to Opt plus 1em.

These are the \leftskips inserted by \Centering, \RaggedLeft, and \RaggedRight.

“\leftskip (glue at left of justified lines)” [2, p. 274]

\leftskip must be set to a finite value, to make hyphenation possible. Setting it to infinite values like Opt plus 1fil makes hyphenation almost impossible.
These are the \rightskip inserted by \Centering, \RaggedLeft, and \RaggedRight.

\rightskip (glue at right of justified lines)” [2, p. 274]

\rightskip must be set to a finite value, to make hyphenation possible. Setting it to infinite values like \opt plus \fil makes hyphenation almost impossible.

These are the \parfillskip inserted by \Centering, \RaggedLeft, and \RaggedRight.

\parfillskip (additional \rightskip at end of paragraphs)” [2, p. 274]

The normal setting for \parfillskip is \opt plus \fil; the parameters are provided for testing combinations of \left\rightskip and \parfillskip.

These are the \parindent inserted by \Centering, \RaggedLeft, and \RaggedRight.

\parindent (width of \indent)” [2, p. 274]

\parindent is the indent of the first line of a paragraph and should be set to \opt, since indented lines in ragged text do not look good.

\RaggedSpaceskip is the \spaceskip used by \Centering, \RaggedLeft, and \RaggedRight.

\spaceskip (glue between words, if nonzero)” [2, p. 274]

If \spaceskip is nonzero, the \spaceskip glue is used for an interword space. The plain solution sets \spaceskip to \3333em so that the spaces between words are fixed. This can only be used with proportional fonts, since with monospaced fonts like cmtt the \spaceskip should be set to the width of a space ‘ ’, which is e.g. \5em in cmtt. So plain provides the command \ttraggedright for monospaced fonts which doesn’t set \spaceskip.

To solve this problem we use the package ever sel to distinguish between monospaced and proportional fonts. If the current font is monospaced (\fontdimen3 = \opt) we set \spaceskip to the interword space defined by the font (\fontdimen2); otherwise we use \RaggedSpaceskip.\footnote{This will not allow hyphenation of typewriter fonts; \LaTeX~disables this by setting \hyphenchar to \-1 for the \ttfamily.}

\RaggedXSpaceskip is the \xspaceskip used by \Center, \RaggedLeft, and \RaggedRight.

\xspaceskip (glue between sentences, if nonzero)” [2, p. 274]
\xspaceskip is the glue between sentences (after elements with a space factor ≥ 2000), if nonzero. Here we also have to distinguish between monospaced and proportional fonts using \everysel.

The parameters have the following initial setting:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>\TeX setting</th>
<th>Ragged2e setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>\CenteringLeftskip</td>
<td>Opt plus 1fil</td>
<td>Opt plus 2em</td>
</tr>
<tr>
<td>\RaggedLeftLeftskip</td>
<td>Opt plus Opt minus Opt</td>
<td>Opt plus 2em</td>
</tr>
<tr>
<td>\RaggedRightLeftskip</td>
<td>Opt plus Opt minus Opt</td>
<td>Opt plus 2em</td>
</tr>
<tr>
<td>\CenteringRightskip</td>
<td>Opt plus 1fil minus Opt minus Opt</td>
<td>Opt plus 2em</td>
</tr>
<tr>
<td>\RaggedLeftRightskip</td>
<td>Opt plus Opt minus Opt</td>
<td>Opt plus 2em</td>
</tr>
<tr>
<td>\RaggedRightRightskip</td>
<td>Opt plus Opt minus Opt</td>
<td>Opt plus 2em</td>
</tr>
<tr>
<td>\CenteringParfillskip</td>
<td>Opt plus Opt minus Opt</td>
<td>Opt plus 2em</td>
</tr>
<tr>
<td>\RaggedLeftParfillskip</td>
<td>Opt plus Opt minus Opt</td>
<td>Opt plus 2em</td>
</tr>
<tr>
<td>\RaggedRightParfillskip</td>
<td>Opt plus Opt minus Opt</td>
<td>Opt plus 2em</td>
</tr>
<tr>
<td>\CenteringParindent</td>
<td>Opt</td>
<td>Opt</td>
</tr>
<tr>
<td>\RaggedLeftParindent</td>
<td>Opt</td>
<td>Opt</td>
</tr>
<tr>
<td>\RaggedRightParindent</td>
<td>Opt</td>
<td>Opt</td>
</tr>
<tr>
<td>\RaggedSpaceskip</td>
<td>0pt</td>
<td>0.3333em/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\fontdimen2\textwidth2</td>
</tr>
<tr>
<td>\RaggedXSpaceskip</td>
<td>0pt</td>
<td>0.5em/0pt$^2$</td>
</tr>
</tbody>
</table>

3.1.3 The environments

- **Center** Center is fully compatible with center, but uses \Centering instead of \centering.
- **FlushLeft** FlushLeft is fully compatible with flushleft, but uses \RaggedRight instead of \raggedright.
- **FlushRight** FlushRight is fully compatible with flushright, but uses \RaggedLeft instead of \raggedleft.

E.g. FlushLeft can be used in the same way as flushleft:

\begin{FlushLeft}
\text{text, which is set ragged-right}
\end{FlushLeft}

4 Options

This package has the following options:

\[^2\text{For proportional and monospaced fonts.}\]
5 REQUIRED PACKAGES

OriginalCommands The \LaTeX-commands \centering, \raggedleft, and \raggedright and the \LaTeX-environments center, flushleft, and flushright remain unchanged. It is the default.

NewCommands The \LaTeX-commands \centering, \raggedleft, and \raggedright and the \LaTeX-environments center, flushleft, and flushright are set equal to their counterparts defined by \ragged2e. Thus \raggedright invokes \RaggedRight. The original commands can be accessed under the Names \LaTeX\langle original name \rangle, e.g. \LaTeX\raggedright.

OriginalParameters The parameters used by the commands implemented by \ragged2e are initialized with the default settings used by \LaTeXe.

NewParameters The parameters used by the commands implemented by \ragged2e are initialized with the default settings defined by \ragged2e. It is the default.

5 Required packages

This package requires the following package:

everyset[5] It is used to distinguish between monospaced and proportional fonts.

6 The implementation

6.1 Initial Code

\if@raggedtwoe@originalcommands \if@raggedtwoe@originalcommands is used to flag the use of the OriginalCommands or NewCommands option.

\newif\if@raggedtwoe@originalcommands

\if@raggedtwoe@originalparameters \if@raggedtwoe@originalparameters is used to flag the use of the OriginalParameters or NewParameters option.

\newif\if@raggedtwoe@originalparameters

6.2 Declaration of options

6.2.1 OriginalCommands option

The OriginalCommands and NewCommands options control the meaning of the \LaTeX-commands for ragged text: If NewCommands
is used the \LaTeX-commands are set equal to the commands defined by \raggedtwoe.

\begin{verbatim}
\DeclareOption{OriginalCommands}{\@raggedtwoe@originalcommandstrue}
\DeclareOption{NewCommands}{\@raggedtwoe@originalcommandsfalse}
\end{verbatim}

6.2.2 OriginalParameters option

The OriginalParameters and NewParameters options control the defaults for the parameters used by the commands implemented by \raggedtwoe: If NewParameters is used the parameters are set to the values defined by \raggedtwoe.

\begin{verbatim}
\DeclareOption{OriginalParameters}{\@raggedtwoe@originalparameterstrue}
\DeclareOption{NewParameters}{\@raggedtwoe@originalparametersfalse}
\end{verbatim}

6.3 Executing options

The default options are OriginalCommands and NewParameters.

\begin{verbatim}
\ExecuteOptions{OriginalCommands,NewParameters}
\ProcessOptions\relax
\end{verbatim}

6.4 Loading packages

We need the \everysel package.

\begin{verbatim}
\RequirePackage{everysel}
\end{verbatim}

6.5 Allocations

First we allocate the parameters

\begin{verbatim}
\newlength{\CenteringLeftskip}
\newlength{\RaggedLeftLeftskip}
\newlength{\RaggedRightLeftskip}
\newlength{\CenteringRightskip}
\newlength{\RaggedLeftRightskip}
\newlength{\RaggedRightRightskip}
\newlength{\CenteringParfillskip}
\newlength{\RaggedLeftParfillskip}
\newlength{\RaggedRightParfillskip}
\newlength{\CenteringParindent}
\newlength{\RaggedLeftParindent}
\newlength{\RaggedRightParindent}
\newlength{\RaggedSpaceskip}
\newlength{\RaggedXSpaceskip}
\end{verbatim}

6.6 Initializations

Depending on \if@raggedtwoe@originalparameters we initialize the parameters with the values \LaTeX uses for its own commands or
6.7 Setting the \spaceskip and \xspaceskip

To set ragged text with proportional fonts and monospaced fonts correctly, we must distinguish between these two kinds of fonts everytime a font is loaded. Otherwise the settings for e.g. a proportional fonts would be in effect if you start \RaggedRight in \rmfamily and then switch to \ttfamily.

We do the setting with the help of everyset[5], which allows us to define code which is (hopefully) executed after every fontchange in a LaTeX document.\footnote{\textit{It is executed after every \selectfont, so if you stay within NFSS and don't declare your fonts with commands like \newfont and then switch to them, it will work.}}

\if@raggedtwoe@spaceskip \if@raggedtwoe@spaceskip signals the use of commands defined by ragged2e to the command inserted into \selectfont. It is set to true by these commands and restored to false by \TeX when the scope of them ends.
\newif\if@raggedtwoe@spaceskip
\@raggedtwoe@everyselectfont is our code inserted into \selectfont.
\newcommand{\@raggedtwoe@everyselectfont}{% 
  \if@raggedtwoe@spaceskip
    If no command defined by ragged2e is in use, we do nothing. But if it is, we look at \fontdimen3 to see if the current font is monospaced or not. If it is, we set \spaceskip to the value intended by the designer of the font (\fontdimen2 and \xspaceskip to 0pt. If it isn’t, we use the values defined by \RaggedSpaceskip and \RaggedXSpaceskip.
    \ifdim\fontdimen\thr@@\font=\z@\relax
      \setlength{\spaceskip} {\fontdimen\tw@\font}  
      \setlength{\xspaceskip} \z@  
    \else
      \setlength{\spaceskip} {\RaggedSpaceskip}  
      \setlength{\xspaceskip} {\RaggedXSpaceskip}  
    \fi
  \fi
}\EverySelectfont{\@raggedtwoe@everyselectfont}

6.8 The commands
\@raggedtwoe@savedcr We save the definition of \ in \@raggedtwoe@savedcr.
\let\@raggedtwoe@savedcr\\ 
\Centering \Centering first lets \ = \@centercr, but only if \ has its original meaning, otherwise \center would not work inside environments like \tabular etc., in which \ has a different meaning. Then, the \LaTeX and \TeX-parameters are set. \@rightskip is \TeX’s version of \rightskip.

"Every environment, like the list environments, that set \rightskip to its 'normal' value set it to \@rightskip" [1]

Finally we signal the code inserted into \selectfont that we are active.
\newcommand{\Centering}{% 
  \ifx\\@raggedtwoe@savedcr
    \let\\@centercr
  \fi
  \setlength{\leftskip} {\CenteringLeftskip}  
  \setlength{\@rightskip} {\CenteringRightskip}  
  \setlength{\rightskip} {\@rightskip}  
  \setlength{\parfillskip} {\CenteringParfillskip}  
  \setlength{\parindent} {\CenteringParindent}  
  \@raggedtwoe@spaceskiptrue
}\
\RaggedLeft \RaggedLeft is like \Centering; it only uses other parameters.
   \newcommand{\RaggedLeft}{%
   \ifx\@raggedtwoe@savedcr
   \let\@centercr\@raggedtwoe@savedcr
   \setlength{\leftskip}{\RaggedLeftLeftskip}\%
   \setlength{\@rightskip}{\RaggedLeftRightskip}\%
   \setlength{\rightskip}{\@rightskip}\%
   \setlength{\parfillskip}{\RaggedLeftParfillskip}\%
   \setlength{\parindent}{\RaggedLeftParindent}\%
   \@raggedtwoe@spaceskiptrue
   \}

\RaggedRight \RaggedRight is like \Centering; it only uses other parameters.
\newcommand{\RaggedRight}{%
\ifx\@raggedtwoe@savedcr
\let\@centercr\@raggedtwoe@savedcr
\setlength{\leftskip}{\RaggedRightLeftskip}\%
\setlength{\@rightskip}{\RaggedRightRightskip}\%
\setlength{\rightskip}{\@rightskip}\%
\setlength{\parfillskip}{\RaggedRightParfillskip}\%
\setlength{\parindent}{\RaggedRightParindent}\%
\@raggedtwoe@spaceskiptrue
\}

\RaggedLeft  \RaggedLeft is like \Centering; it only uses other parameters.
\newcommand{\RaggedLeft}{%
\ifx\@raggedtwoe@savedcr
\let\@centercr\@raggedtwoe@savedcr
\setlength{\leftskip}{\RaggedLeftLeftskip}\%
\setlength{\@rightskip}{\RaggedLeftRightskip}\%
\setlength{\rightskip}{\@rightskip}\%
\setlength{\parfillskip}{\RaggedLeftParfillskip}\%
\setlength{\parindent}{\RaggedLeftParindent}\%
\@raggedtwoe@spaceskiptrue
\}

6.9 The environments

\newcommand{\flushleft}{%
\begin{trivlist}\
\RaggedLeft\item\relax
\end{trivlist}\%
\}

\newcommand{\flushright}{%
\begin{trivlist}\
\RaggedRight\item\relax
\end{trivlist}\%
\}

\newenvironment{flushleft}{%
\begin{trivlist}\
\RaggedLeft\item\relax
\end{trivlist}\%
\}

\newenvironment{flushright}{%
\begin{trivlist}\
\RaggedRight\item\relax
\end{trivlist}\%
\}

\newenvironment{center}{%
\begin{trivlist}\
\Centering\item\relax
\end{trivlist}\%
\}

\newenvironment{flushleft}{%
\begin{trivlist}\
\RaggedLeft\item\relax
\end{trivlist}\%
\}

\newenvironment{flushright}{%
\begin{trivlist}\
\RaggedRight\item\relax
\end{trivlist}\%
\}

\newenvironment{center}{%
\begin{trivlist}\
\Centering\item\relax
\end{trivlist}\%
\}

\newenvironment{flushleft}{%
\begin{trivlist}\
\RaggedLeft\item\relax
\end{trivlist}\%
\}

\newenvironment{flushright}{%
\begin{trivlist}\
\RaggedRight\item\relax
\end{trivlist}\%
\}

\newenvironment{center}{%
\begin{trivlist}\
\Centering\item\relax
\end{trivlist}\%
\}

\newenvironment{flushleft}{%
\begin{trivlist}\
\RaggedLeft\item\relax
\end{trivlist}\%
\}

\newenvironment{flushright}{%
\begin{trivlist}\
\RaggedRight\item\relax
\end{trivlist}\%
\}

\newenvironment{center}{%
\begin{trivlist}\
\Centering\item\relax
\end{trivlist}\%
\}

\newenvironment{flushleft}{%
\begin{trivlist}\
\RaggedLeft\item\relax
\end{trivlist}\%
\}

\newenvironment{flushright}{%
\begin{trivlist}\
\RaggedRight\item\relax
\end{trivlist}\%
\}
6.10 Overloading the \LaTeX-commands

If the option NewCommands is used, we save the original \LaTeX-commands for ragged text and overload them.

\[
\text{\texttt{\textbackslash if@raggedtwoe@originalcommands}}
\text{\texttt{\textbackslash else}}
\text{\texttt{\textbackslash let\LaTeXcentering\texttt{\textbackslash centering}}}
\text{\texttt{\textbackslash let\LaTeXraggedleft\texttt{\textbackslash raggedleft}}}
\text{\texttt{\textbackslash let\LaTeXraggedright\texttt{\textbackslash raggedright}}}
\text{\texttt{\textbackslash let\LaTeXcenter\texttt{\textbackslash center}}}
\text{\texttt{\textbackslash let\LaTeXflushleft\texttt{\textbackslash flushleft}}}
\text{\texttt{\textbackslash let\LaTeXflushright\texttt{\textbackslash flushright}}}
\text{\texttt{\textbackslash let\LaTeX\texttt{"\textbackslash centering\texttt{"\textbackslash Centering}}}}
\text{\texttt{\textbackslash let\LaTeX\texttt{"\textbackslash raggedleft\texttt{"\textbackslash RaggedLeft}}}}
\text{\texttt{\textbackslash let\LaTeX\texttt{"\textbackslash raggedright\texttt{"\textbackslash RaggedRight}}}}
\text{\texttt{\textbackslash let\begin\texttt{"\textbackslash center\texttt{"\textbackslash \beginCenter}}}}
\text{\texttt{\textbackslash let\begin\texttt{"\textbackslash flushleft\texttt{"\textbackslash \beginFlushleft}}}}
\text{\texttt{\textbackslash let\begin\texttt{"\textbackslash flushright\texttt{"\textbackslash \beginFlushRight}}}}
\text{\texttt{\textbackslash fi}}
\text{\texttt{\textbackslash /package}}
\]

7 Acknowledgements

A first version of this package for \LaTeX2.09 was named raggedri[6]. Laurent Siebenmann (\texttt{lcs@topo.math.u-psud.fr}) with his style \texttt{ragged.sty}[7] provided the final impulse for this new implementation. Without the constant nagging of Rainer Sieger (\texttt{rsieger@awi-bremerhaven.de}) this package might not be.

References


[4] Frank Mittelbach and Rainer Schöpf. The file \texttt{cmfonts.fdd} for use with \LaTeX2\v. Part of the \LaTeX-distribution.

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\@raggedtwoe@originalcommandsfalse . . . . . . 23
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