Adjusting Margins for Multicolumn and Unicolumn Output*†

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Abstract

This package provides an extension of the multicol package [1] with the option to change the margins for multicolumn and unicolumn layout. The package understands the difference between the even and odd margins for two side printing.

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†Note: This package is released under terms which affect its use in commercial applications. Please see the details at the top of the source file

1 Introduction

One of the common requests from the book designers is the possibility to change the margins of the text in the midddle of the page. The standard LaTeX `list` environment does exactly this. Thus it is not surprising that many packages creatively use this tool to change the layout. An example is the changepage package [2]. Unfortunately this approach has a seriour drawback: a list sets the margins globally. If the material is split between the pages, the margins on the first page are repeated on all the subsequent pages. While this is fine for one-side printing, it leads to a catastrophe for the two-sided one, as can be seen from the following example (provided by Ivo Welch):

```
\documentclass{book}
\usepackage{lipsum,multicol}
\evensidemargin=1.5in
\oddsidemargin=-3em
\textwidth=5in

\newenvironment{chmargin}[2]{%
  \begin{list}{}{\topsep0pt\partopsep0pt\itemsep0pt\parsep\parskip%
      \listparindent\parindent\itemindent\parindent
      \leftmargin#1\rightmargin#2\relax}\item}%
  {\end{list}}

\begin{document}

\chapter{Show}
\section{Normal}
\marginpar{I need a lot of outer margin space in the normal text.}
\lipsum[1-10]
\begin{chmargin}{0pt}{-160pt}
  \section{End of Chapter Meterial}
  \textbf{Now I want to use the outer margin because I need width.}
  \lipsum[11-16]
  \fbox{\textbf{\Large Darn---it extends into the inner spine margin now.}}
  \lipsum[17-40]
\end{chmargin}

\end{document}
```

To remedy this problem, we need a completely different approach: we need to change the output routine. This is done in this package.

Since the text with the special layout is often typeset in the multicolumn mode, we load the multicol package [1] and patch it to provide two changes:

1. Margins changes, persistent over the pages.

2. The possibility of an one-column "multicolumn" layout. Of course, this layout does not make sense in the context of the original multicol package, but is useful when the margins are changed.

Note that since this package uses the multicol package, it inherits its special moral obligation for the commercial users. Please see the source file for the details.

This file was commissioned for by Prof. Ivo Welch, http://www.ivo-welch.info/. He also provided sample files and patiently tested it.

2   User Interface

The installation of the class follows the usual practice [3] for LaTeX packages:

1. Run latex on adjmulticol.ins. This will produce the file adjmulticol.sty.

2. Put the file adjmulticol.sty to the place where LaTeX can find them (see [3] or the documentation for your TeX system).

3. Update the database of file names. Again, see [3] or the documentation for your TeX system for the system-specific details.

4. The file adjmulticol.pdf provides the documentation for the package (this is the file you are probably reading now).

As an alternative to items 2 and 3 you can just put the files in the working directory where your .tex file is.

To use this package, add to the preamble of your document the line \usepackage{adjmulticol}.

The package provides two new environments for adjusted multicolumn layout.

adjmulticols   The environment adjmulticols is similar to the environment multicols, but it has three mandatory arguments instead of one:

> \begin{adjmulticols}{⟨number⟩}{⟨inner margin⟩}{⟨outer margin⟩}
> ⟨text⟩
> \end{adjmulticols}

For example,

```
 \begin{adjmulticols}{2}{12pt}{-1in}
    Text Text Text
 \end{adjmulticols}
```

Here ⟨number⟩ is the number of columns. Unlike multicols, adjmulticols environment allows this number to be 1.

The ⟨inner margin⟩ and ⟨outer margin⟩ are calculated from the current text area margins, so negative values mean the extension of the text area. In one-sided printing ⟨inner margin⟩ is the left margin, and ⟨outer margin⟩ is the right margin. You probably would not want to use this package for one-sided printing, since in this case changepage package [2] works fine. In two-sided printing ⟨inner margin⟩ is the margin on the spine side of the page, and ⟨outer margin⟩ is the margin on the other side.

You can use the optional arguments of the `multicols` environment. Note that the argument of the first optional argument, the header text spread over all columns, is typeset with the *normal* margins. If you want to change margins for the header too, you may want to use one-column `adjmulticols` environment instead.

`adjmulticols*` The starred version of the environment, `adjmulticols*` is similar to the `multicols*` environment: it does not balance the columns on the last page.

3 Implementation

3.1 Declarations

We start with declaration, who we are:

```
1 ⟨style⟩\NeedsTeXFormat{LaTeX2e}
2 ⟨∗gobble⟩
3 \ProvidesFile{adjmulticol.dtx}
4 ⟨/gobble⟩
5 ⟨style⟩\ProvidesPackage{adjmulticol}
6 ⟨∗style⟩
7 [2020/03/06 v1.2 Adjusted margins for multicolumn layout]
```

3.2 Options

All options are sent to `multicols`:

```
8 \DeclareOption*{\PassOptionsToPackage{\CurrentOption}{multicol}}
9 \ProcessOptions\relax
```

3.3 Loading Packages

We use `multicol` to get all the code from it:

```
10 \RequirePackage{multicol}
```

3.4 Registers

`\adjmc@inner`   Inner margin delta: left on odd pages, right on even pages for two-sided typesetting, and left for one-sided typesetting.

```
11 \newdimen\adjmc@inner
```

`\adjmc@outer`   Outer margin delta: right on odd pages, left on even pages, and right for two-sided typesetting

```
12 \newdimen\adjmc@outer
```

`\adjmc@saved@leftmargin`   We save the value of `\multicol@leftmargin` between the calls in the register `\adjmc@savedleftmargin`:

```
13 \newdimen\adjmc@saved@leftmargin
```

3.5 Starting Environment

`\adjmulticols`   We have three mandatory arguments instead of one for `multicols`: the number of columns, the left margin delta and the right margin delta:

```
14 \def\adjmulticols#1#2#3{\col@number#1\relax
15   \def\@tempa{#2}%
16   \ifx\@tempa\@empty\adjmc@inner\z@\else\adjmc@inner#2\fi
17   \def\@tempa{#3}%
18   \ifx\@tempa\@empty\adjmc@outer\z@\else\adjmc@outer#3\fi
```

The standard `multicols` have the minimum of two columns. We, of course, want to consider one column layout too:

```
19    \ifnum\col@number<\@ne
20      \PackageWarning{adjmulticol}%
21       {Using '\number\col@number'
22        columns doesn't seem a good idea.^^J
23        I therefore use one columns instead}%
24      \col@number\@ne\fi
25    \ifnum\col@number>10
26      \PackageError{adjmulticol}%
27       {Too many columns}%
28       {Current implementation doesn't
29        support more than 10 columns.%
30        \MessageBreak
31        I therefore use 10 columns instead}%
32      \col@number10 \fi
```

As in the standard package we redefine the footnote making command:

```
33      \ifx\@footnotetext\mult@footnotetext\else
34        \let\orig@footnotetext\@footnotetext
35        \let\@footnotetext\mult@footnotetext
36      \fi
```

And look for the optional arguments

```
37    \@ifnextchar[\adjmult@cols{\adjmult@cols[]}}
```

\adjmult@cols   Looking for the second optional argument. Note that we use `\premulticols` for the default:

```
38 \def\adjmult@cols[#1]{\@ifnextchar[%
39    {\adjmult@@cols{#1}}%
40    {\adjmult@@cols{#1}[\premulticols]}}
```

\adjmult@@cols   And now we are gathered all arguments:

```
41 \def\adjmult@@cols#1[#2]{%
```

The macro `\prepare@multicols` uses the current value of `\linewidth`. We do not change his, but rather change `\linewidth`:

```
42      \advance\linewidth by -\adjmc@inner\relax
43      \advance\linewidth by -\adjmc@outer\relax
```

Then we redefine the output routines:

```
44 \let\page@sofar=\adjmc@page@sofar
```

and start the standard multicols:

```
45    \mult@@cols#1[#2]}
```

\set@mult@vsize   The formula for `\vsize` in multicols seem to work only for column number above 2. Here we add special case of 1.

```
46 \def\set@mult@vsize#1{%
47      \vsize\@colroom
48      \@tempdima\baselineskip
```

```
49      \advance\@tempdima-\topskip
50      \advance\vsize\@tempdima
51      \vsize\col@number\vsize
52      \advance\vsize-\@tempdima
53      \ifnum\col@number>1\relax
54      \advance\vsize\col@number\baselineskip
55      \else
56      \advance\vsize-2\baselineskip
57      \fi
58      #1\advance\vsize
59          \c@collectmore\baselineskip}
```

3.6   Ending Environment

\endadjmulticols Here we use the standard environment end. Note that it uses `\@checkend`, so we need to redefine it to fool the check. We need to do it globally to work inside a box too.

```
60 \def\endadjmulticols{%
61      \global\let\@ADJMC@checkend\@checkend
62      \gdef\@checkend##1{}%
63      \endmulticols
64      \global\let\@checkend\@ADJMC@checkend}
```

3.7   Output Routines

\adjmc@page@sofar@orig First, we save the original declaration of `\page@sofar`:

```
65 \let\adjmc@page@sofar@orig=\page@sofar
```

\adjmc@page@sofar We redefine `\page@sofar` to change the margins and allow for one-column output:

```
66 \def\adjmc@page@sofar{%
```

If we have one column, the standard mechanisms leave empty space instead of the first column. Ok, we use the fact that there is a copy of the first column in `\mult@firstbox`...

```
67      \ifnum\col@number=\@ne
68      \setbox\mult@rightbox\box\mult@firstbox
69      \fi
```

We redefine `\multicol@leftmargin` to introduce the shift of the box. We save the old code in `\adjmc@saved@leftmargin`

```
70      \adjmc@saved@leftmargin=\multicol@leftmargin
71      \if@twoside
72        \ifodd\c@page
73          \advance\multicol@leftmargin by \adjmc@inner\relax
74        \else
75          \advance \multicol@leftmargin by \adjmc@outer\relax
76        \fi
77      \else
78        \advance \multicol@leftmargin by \adjmc@inner\relax
79      \fi
```

Then we invoke the original `\page@sofar` and restore the margin:

```
80    \adjmc@page@sofar@orig
81    \multicol@leftmargin=\adjmc@saved@leftmargin}
```

3.8   Not Balancing Columns

The starred versions do not balance the columns.

`\adjmulticols*` This follows the code of the multicols package:

```
82 \newenvironment{adjmulticols*}{%
83    \ifinner
84      \PackageWarning{multicol}%
85        {multicols* inside a box does
86         not make sense.\MessageBreak
87         Going to balance anyway}%
88    \else
89      \let\balance@columns@out
90          \multi@column@out
91    \fi
92    \adjmulticols}{%
93    \vfill
94   \endadjmulticols}
```

3.9   Ending the Style

```
95 ⟨/style⟩
```

References

[1] Frank Mittelbach. *An Enironment for Multicolumn Output*, August 2006. `http://mirrors.ctan.org/macros/latex/required/tools/multicol.pdf`.

[2] Peter Wilson and Will Robertson. *The changepage and chngpage Packages*, October 2009. `http://mirrors.ctan.org/macros/latex/contrib/changepage`.

[3] UK TeX Users Group. UK list of TeX frequently asked questions. `http://www.tex.ac.uk/cgi-bin/texfaq2html`, 2008.

Change History

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