The mdframed package[1]

auto-split frame environment

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Working with the command \fbox or \fcolorbox, one has to handle page breaks by hand, meaning that you have to split up the \fbox into two. The present package defines the environment mdframed which automatically deals with page breaks, whence the name „breakable“.

By using \newenvironment the user may choose between several individual designs.

Contents

1. Motivation

Many users wish to (further) emphasize lemmata, definitions, proofs etc. The package mdframed allows to create environments with breakable frames. I think an example is the best way to demonstrate the properties.

```
\newtheorem{mdtheorem}{Theorem}[section]
\newenvironment{theorem}{\begin{mdframed}%
    [linewidth=2,leftmargin=40,rightmargin=40,%
     backgroundcolor=yellow,linecolor=blue,%
     splittopskip=\topskip,skipbelow=\baselineskip,%
     skipabove=\baselineskip]%
    \begin{mdtheorem}}{\end{mdtheorem}\end{mdframed}}
\begin{theorem}[Pythagorean theorem]
In any right triangle, the area of the square whose
side is the hypotenuse is equal to the sum of the
areas of the squares whose sides are the two legs.
\[ a^2+b^2=c^2 \]
\end{theorem}
```

Theorem 1.1 (Pythagorean theorem). *In any right triangle, the area of the square whose side is the hy-*

[1] Extending the package framed.sty.

[2] With thanks to Heiko Oberdiek, Rolf Niepraschk, Martin Scharrer and Herbert Voss.

potenuse is equal to the sum of the areas of the squares whose sides are the two legs.

$$a^2 + b^2 = c^2$$

2. Syntax

The package itself loads the packages kvoptions, etoolbox, calc and color. By setting the correct options mdframed will load xcolor, tikz or pstricks.

Load the package as usual:

```
\usepackage[<GLOBAL OPTIONS>]{mdframed}
```

The package defines only one environment with the following syntax:

```
\begin{mdframed}[<LOCAL OPTIONS>]
    <CONTENT>
\end{mdframed}
```

3. Options

The package allows to set global and local options which are explained below.

3.1. Global Options

The following options are only global options.

xcolor By setting this key, the package xcolor will be loaded with the given value(s). Without any value mdframed loads the package color without any options. default=none

style With this key you can change the way frames are drawn. By using **style=0** the frames are drawn by the LaTeX-command `\rule`. By setting the key to **style=1** the package tikz will draw the frames. By setting the key to **style=3** the package pstricks will draw the frames. The manipulation of the frames depends on the **style**. For further information see below. default=0

3.2. Global and Local Options

The options listed below can be set globally or locally.

\mdfsetup To set the options globally you can use the optional argument of `\usepackage` or you can use the command `\mdfsetup` which is not limited to the header.

3.2.1. Options with lengths

In figure (1) you can see the adjustable lengths which will be described below. All lengths accept two kinds of input. The first one is a length (e.g. 2pt) and the second one is a number (e.g. 2) which will be multiplied by **1 defaultunit**.

defaultunit see the sentence above. default=pt

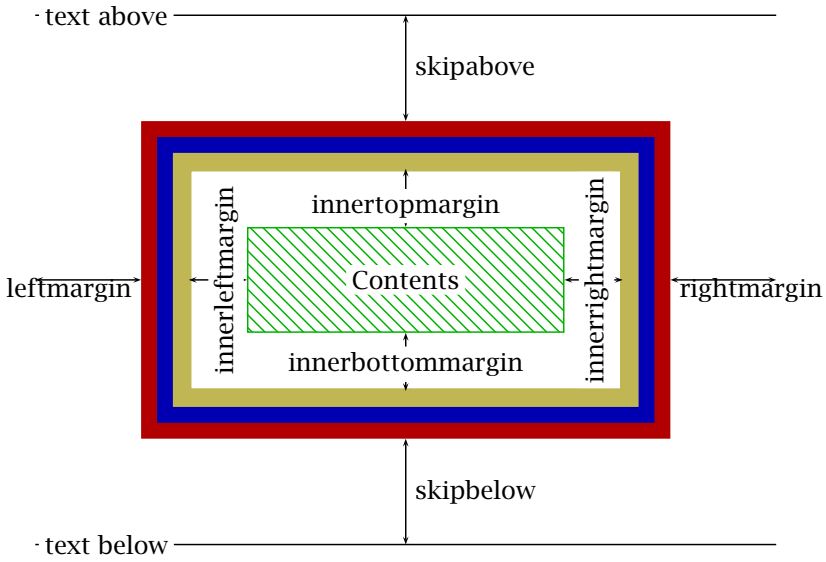

Figure 1: adjustable lengths of mdframed

skipabove Sets an additional skip above the frame. default=0pt

skipbelow Sets an additional skip below the frame. default=0pt

margin This option is not longer supported. Use **leftmargin** and **rightmargin** instead.

leftmargin Sets the length of the left margin of the environment. default=0pt

rightmargin Sets the length of the right margin of the environment. default=0pt

innerleftmargin Sets the length of the inner left margin of the environment. default=10pt

innerrightmargin Sets the length of the inner right margin of the environment. default=10pt

innertopmargin Sets the length of the inner top margin of the environment. default= .4\baselineskip

innerbottommargin Sets the length of the inner bottom margin of the environment. default= .4\baselineskip

The following lengths are not shown in figure (1).

splittopskip Sets the length of the skip above the splitted part of the environment. default=0pt

splitbottomskip Sets the length of the skip below the splitted part of the environment. **This works only with style=0 and style=3.** default=0pt

linewidth Sets the width of the line around the environment. default=0.4pt

roundcorner Sets the size of the radius of the corners of the frames. **This works only with style=1 and style=3.** default=0pt

innerlinewidth	Sets the width of the inner line around the environment. **This works only with style=1.**	default=0pt
outerlinewidth	Sets the width of the outer line around the environment. **This works only with style=1.**	default=0pt
middlelinewidth	Sets the width of the middle line around the environment. **This works only with style=1.**	default= linewidth

3.2.2. Colored Options

linecolor	Sets the color of the line around the environment.	default=black
innerlinecolor	Sets the color of the inner line around the environment. **This works only with style=1.**	default= linecolor
middlelinecolor	Sets the color of the middle line around the environment. **This works only with style=1.**	default= linecolor
outerlinecolor	Sets the color of the outer line around the environment. **This works only with style=1.**	default= linecolor
backgroundcolor	Sets the color of the background of the environment.	default=white
fontcolor	Sets the color of the contents of the environment.	default=black

3.3. Hidden Lines

The following options work only with style=0 and style=3.

topline	Draws a line at the top.	default=true
bottomline	Draws a line at the bottom.	default=true
leftline	Draws a line on the left.	default=true
rightline	Draws a line on the right.	default=true

Remark: By setting style=3 only the following combinations are implemented

- **leftline=true, rightline=true, bottomline=true, topline=true**
- **leftline=true, rightline=true, bottomline=false, topline=true**
- **leftline=true, rightline=true, bottomline=true, topline=false**
- **leftline=true, rightline=false, bottomline=true, topline=true**
- **leftline=false, rightline=true, bottomline=true, topline=true**
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- leftline=false, rightline=false, bottomline=false, topline=true

3.3.1. Useful options

ntheorem Before setting this boolkey, you have to load the package ntheorem. With this option you set the values `\theorempreskipamount` and `\theorempostskipamount` to 0pt. default=false

pstrickssetting With this key you can pass several options to `\psset`. For example if you want all lines dashed you will have to set **pstrickssetting={linestyle=dashed}**. It is very important to put the options of **pstrickssetting** in brackets. **This works only with style=3.** default=none

4. Known Problems

In this section I will collect known problems. In case you encounter any further problems, please drop me an email, marco.daniel'at'mada-nada.de.

Do you have any ideas / wishes on further extensions to this package? Please let me know!

1. So far the environment isn't compatible with the package gmverb.
2. So far it isn't possible to use the multicolumn environment.
3. So far it isn't possible to use footnotes.

5. ToDo

1. see „Known Problems".
2. No limitations of any style.
3. Create new styles.
4. Improve page breaks.

6. Acknowledgement

Thanks for the bug reports and suggestions
Dick Nickalls; Dr. Dietrich Grau; Piazza Luca.

Thanks for proofreading
Nahid Shajari.

A. More information

In the following section I want to present how to create your own frame.

A.1. How does mdframed work?

With the environment `\begin{mdframed}...\end{mdframed}` the whole contents will be saved in a `\savebox` called `\@tempboxa`. After the calculation of the width and the height of the `\@tempboxa` the box will be set sequently. The following figure demonstrates this.

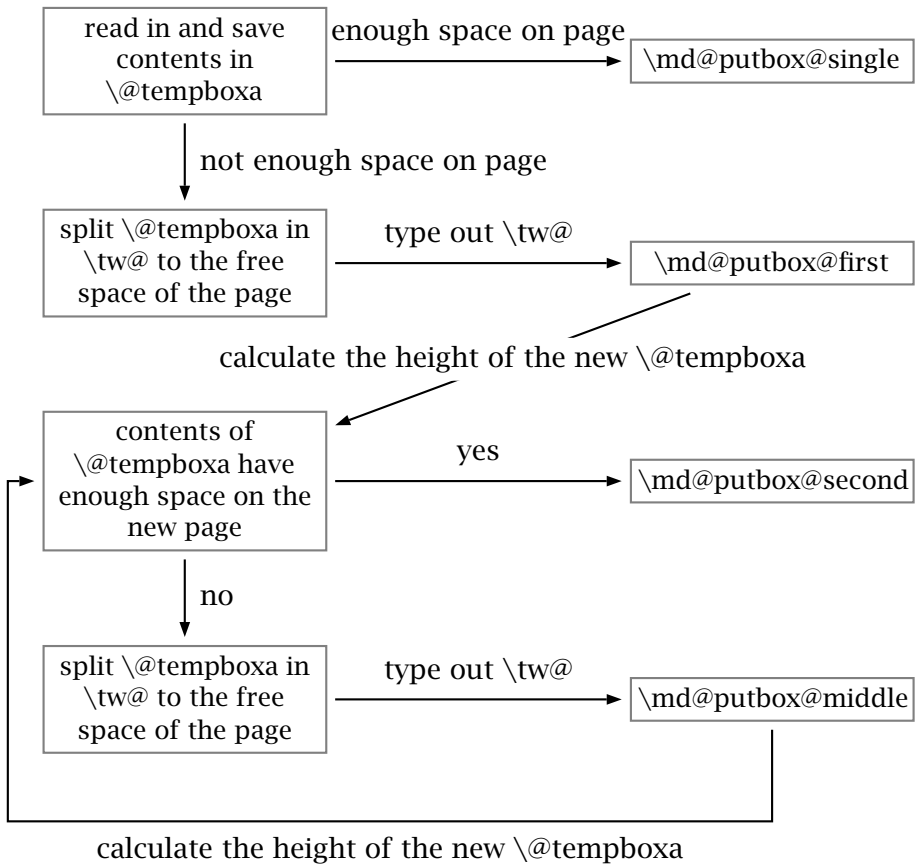

Figure 2: Setting the contents of mdframed

The width of the contents is the result of the settings of **leftmargin**, **rightmargin**, **linewidth**, **innerleftmargin** and **innerrightmargin** (see figure (1)).

A.2. The Framecommands

The package mdframed knows four kinds of „Framecommand“. These commands tell LaTeX how to set the contents of mdframed.

`\md@putbox@single` This command sets the contents of a single non-splitted frame.

`\md@putbox@first` This command sets the contents of the first frame of a splitted frame.

`\md@putbox@middle` This command sets the contents of the middle frame of a splitted frame.

\md@putbox@second This command sets the contents of the last frame of a splitted frame.

Uses the explained commands we give an example. The command \box use the contents of the savebox and types them out.

First we want to type out the single box without any settings (but with the calculated width).

```
\makeatletter
 \def\md@putbox@single{\box\@tempboxa}
\makeatother
```

I am using the command \leftline to start the „Framecommands“ at the left.

```
\makeatletter
 \def\md@putbox@single{\leftline{\box\@tempboxa}}
\makeatother
```

Now you have to know how the lengths are named. Every length which can be modified by the options has the following syntax

```
\mdf@'Name of the Length'@length
```

For example the leftmargin is

```
\mdf@leftmargin@length
```

To create only a line at the left with the correct **leftmargin** you can set \md@putboxsingle as follows

```
\makeatletter
\def\md@putbox@single{%
          \leftline{%
               \hspace*{\mdf@leftmargin@length}%
               \rule[-\dp\@tempboxa]{\mdf@linewidth}%
                    {\ht\@tempboxa+\dp\@tempboxa}%
               \box\@tempboxa
          }%
}
\makeatother
```

In this way you can do what you want. If you create your own style you can save the file as md-frame-X.mdf. X must be an integer. In this way you can use the option **style** to load the file by setting **style=X**.