The mdframed package[1]

auto-split frame environment

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The standard methods for framing text (`\fbox` or `\fcolorbox`) require you to handle page breaks by hand, meaning that you have to split the `\fbox` into two. The present package defines the environment mdframed which automatically deals with pagebreaks in framed text.

By defining new environments the user may choose between several individual designs.

Linked files: `mdframed-example-default.pdf` `mdframed-example-tikz.pdf` `mdframed-example-pstricks.pdf` `mdframed-example-texsx.pdf`

Contents

1. Motivation

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

Theorem 1.1 (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.*

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

[1] Extending the package `framed.sty`

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

The frame was defined with the following settings.

```
\newmdtheoremenv[outerlinewidth=2,leftmargin=40,
    rightmargin=40,backgroundcolor=yellow,%
    outerlinecolor=blue,innertopmargin=0pt,%
    splittopskip=\topskip,skipbelow=\baselineskip,%
    skipabove=\baselineskip,ntheorem]{theorem}%
    {Theorem}[section]
\begin{theorem}[Pythagorean theorem]
...
\end{theorem}
```

2. Syntax

The package itself loads the packages `kvoptions`, `etoolbox` 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}
```

To create own environments with `mdframed` see section 3.

Autodetecting floats

I added a detection of `float` or `minipage` environments. If you use mdframed in such an environment mdframed will use the option nobreak automaticly.

Twoside-mode

When you are using mdframed inside `twoside` mode you can set the option innermargin and outermargin (see section 4.2.1).

3. Commands

The following commands should countenance your by the handling with `mdframed`

\newmdenv

The command has the following syntax:

```
\newmdenv[<MDFRAMED OPTIONS>]{Name of the environment}
```

In this way you can simply use:

```
\newmdenv[linecolor=red,frametitle=Infobox]{infobox}
...
\begin{infobox}[backgroundcolor=yellow]
 foo  foo  foo  foo  foo  foo
\end{infobox}
```

\renewmdenv

By using this command you can redifine environments which are created by `\newmdenv`.

\newmdtheoremenv

Since the package is often used to highlight theorem environments, I have created a command[3] to simplify this process. The command has the following syntax:

```
\newmdtheoremenv[<mdframed-options>]{<envname>}%
                [<numberedlike>]{<caption>}[<within>]
```

The last four arguments are equivalent to the command `\newtheorem`. Only the first optional argument is able to pass `mdframed`-options. A simple example is:

```
\theoremstyle{<some style>}
\newmdtheoremenv[linecolor=blue]{lemma}%
                {Lemma}[section]
...
\begin{lemma}[Some title]
  foo  foo  foo  foo  foo  foo
\end{lemma}
```

So far there is no `\renewmdtheoremenv`!

\mdfsetup

To set the options you can use the optional argument of `\usepackage` or you can use the command `\mdfsetup` which is not limited to the preamble. Inside a group the command the settings work only local.

\mdfdefinestyle

`\mdfdefinestyle` allow the user to define diffenrent styles and use as an option of `mdframed` via style. The option style is explained in section 4.2.3.

Here a small example:

```
\mdfdefinestyle{mystyle}{leftmargin=0pt,%
                         linecolor=blue}
....
\begin{mdframed}[style=mystyle]
foo
\end{mdframed}
```

\mdfapptodefinestyle

This commands allows to expand a defined style.[4]

4. Options

The packages provides various options to manipulate frames. In the following section all options are listed. Some internal macros which can be manipulated are not shown in this

[3] Thanks to Martin Scharrer and Enrico Gregorio:
Own command to create new environment

[4] Thanks to Martin Scharrer and Enrico Gregorio:
http://tex.stackexchange.com/questions/34684/argument-of-setkeys

documentation. The listed option are divided in global and local options. The global options can not be used inside `\mdfsetup`.

4.1. Global Options

The following options are only global options.

xcolor default=none

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. If the package `xcolor` is already loaded the given option will be ignored. I recommend to load `xcolor` before mdframed.

frametheod default=default

With this key you can change the way frames are drawn. You can decide whether the frame is drawn with

1. LaTeX-commands `\hrule`, `\vrule`, `\rule`,
2. `TikZ` (the package `TikZ` will be loaded) or
3. `PSTricks` (the package `pstricks` will be loaded).

The option frametheod requires a string. Allowed combination are listed in the following table.

Table 1: Allowed keys for frametheod

Method	Allowed keys
LaTeX-commands	`default, tex, latex, none, 0`
TikZ	`tikz, pgf, 1`
PSTricks	`pstricks, ps, postscript, 2`

FYI It is independently whether the `method` is written with no, one or more capital letter.

Note
The manipulation of the frames depends on the option frametheod. For further information see below.

4.2. Global and Local Options

The options listed below can be set globally or locally and they are not limited to the preamble.

4.2.1. 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. The figure shows three different colored frames. Only frametheod=tikz is able to draw such triple lines.

I know that the predefined length are not well prepaired. Maybe I will change it later.

defaultunit default=pt

see the sentence above.

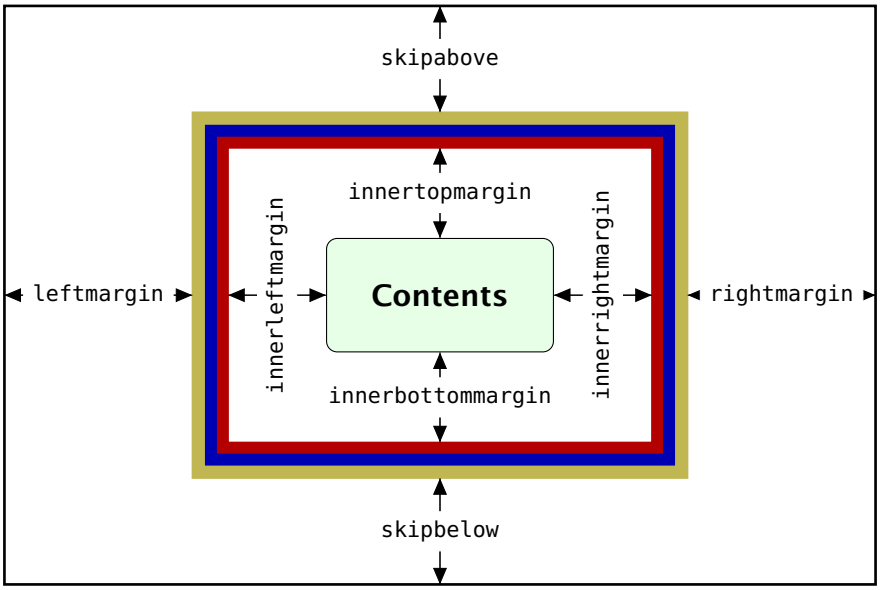

Figure 1: adjustable lengths of mdframed

skipabove default=0pt

Sets an additional skip above the frame.

skipbelow default=0pt

Sets an additional skip below the frame.

margin

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

leftmargin default=0pt

Sets the length of the left margin of the environment.

rightmargin default=0pt

Sets the length of the right margin of the environment.

innerleftmargin default=10pt

Sets the length of the inner left margin of the environment.

innerrightmargin default=10pt

Sets the length of the inner right margin of the environment.

innertopmargin default=.4\baselineskip

Sets the length of the inner top margin of the environment.

innerbottommargin default=.4\baselineskip

Sets the length of the inner bottom margin of the environment.

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

userdefinedwidth default=0pt

Sets the width of the whole mdframed environment. The width represent the width including the line width and the inner margins. The outer margins will be ignored.

outermargin

Sets the length of the outer margin. This option is only avaidable in `twoside`-mode.

innermargin

Sets the length of the inner margint. This option is only avaidable in `twoside`-mode.

splittopskip default=0pt

Sets the length of the skip above the split part of the environment.

splitbottomskip default=0pt

Sets the length of the skip below the splitt part of the environment.

linewidth default=0.4pt

Sets the width of the line around the environment.

roundcorner default=0pt

Sets the size of the radius of the corners of the frames.
This works only with framemethod=TikZ.
This works only with framemethod=PSTricks.

innerlinewidth default=0pt

Sets the width of the inner line around the environment.
This works only with framemethod=TikZ.

outerlinewidth default=0pt

Sets the width of the outer line around the environment.
This works only with framemethod=TikZ.

middlelinewidth default=linewidth

Sets the width of the middle line around the environment.
This works only with framemethod=TikZ.

4.2.2. Colored Options

linecolor default=black

Sets the color of the line around the environment.

backgroundcolor default=white

Sets the color of the background of the environment.

fontcolor default=black

Sets the color of the contents of the environment.

innerlinecolor default=linecolor

Sets the color of the inner line around the environment.
This works only with framemethod=TikZ.

middlelinecolor default=linecolor

Sets the color of the middle line around the environment.
This works only with framemethod=TikZ.

outerlinecolor default=linecolor

Sets the color of the outer line around the environment.
This works only with framemethod=TikZ.

4.2.3. General options

ntheorem default=false

Before setting this boolean key, you have to load the package `ntheorem`.

With this option you set the values `\theorempreskipamount` and `\theorempostskipamount` to 0pt.

nobreak default=false

Sometimes it is useful to prevent a frame from splitting. The nobreak option is used for this purpose. If you activate this option you can enable it by setting nobreak=false.

needspace default=0pt

Sometimes it is useful to set a minimum height befor a frame should be splitted. For such cases you can use needspace. The option requires a length which sets the minimum height befor a frame will be splitted.

style

If you define a special style with `\mdfdefinstyle` you can use the key style to load the style. mdframed has no predefined styles.

align default=left

Sometimes it is usefull to align the environment it selfs. For this you have the option align which can be set to the following strings: left, right and center. The alignments left or right depend on the given lenght leftmargin and rightmargin. Later I will present an example to demonstrate my bad English explanation.

pstrickssetting default=none

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 framemethod=PSTricks.

tikzsetting default=none

With this key you can pass several options to `\tikzset`. Some examples are listed in the next section. It is very important to put the options of tikzsetting in brackets.
This works only with framemethod=TikZ.

apptotikzsetting default=none

With this key you can add several options to tikzsetting. This key based on the idea of manipulation of predefined keys of mdframed. The package mdframed define via `\tikzset` the following keys to draw frames.

- `\tikzset{mdfbox/.style}`
- `\tikzset{mdfcorners./style}`
- `\tikzset{mdfbackground./style}`
- `\tikzset{mdfinnerline./style}`
- `\tikzset{mdfouterline./style}`
- `\tikzset{mdfmiddleline./style}`

Before you change one please have a look at the file `md-frame-1.mdf` to see the settings.
This works only with framemethod=TikZ.

4.3. Hidden Lines

topline default=true

Draws a line at the top.

bottomline default=true

Draws a line at the bottom.

leftline default=true

Draws a line on the left.

rightline default=true

Draws a line on the right.

rightline default=false

With this option you can decide whether all lines should be drawn or not.

4.4. Frametitle

frametitle default=none

The environment get a title. To set a title use frametitle={The Title of the frame} as an option of the environment.

frametitleformat default= `\bfseries \large`

Sets the format of the frame title.

4.5. Footnotes

Inside the environment you can use the command `\footnote` as usual. mdframed uses the syntax of environment `minipage` with the same counter.

Every footnote text will be collect inside a box and will be displayed at the end of the environment mdframed.

footnotedistance default= `\bigskipamount`

The length is the distance between the end of the environement mdframed and the displaying of the `\footnoterule`.

footnoteinside default=true

The position of the footnotes can be changed with the option footnoteinside. The footnotes will be displayed at the end of the environment but you can decide whether the output is inside mdframed or after.

Note The ouput of the footnotes with the option footnoteinside=false are not in a splitted frame. I think it isn't useful because the first line of a new page shouldn't be a footnote.

5. Examples

I outsource the examples in four files to limited the documentation. The files are

`mdframed-example-default`
Demonstration of examples created with framemethod=default.

`mdframed-example-tikz`
Demonstration of examples created with framemethod=TikZ.

`mdframed-example-pstricks`
Demonstration of examples created with framemethod=pstricks.

`mdframed-example-texsx`
Demonstration of examples like interaction with `listings`

The examples are often not equivalent but normally they can be adapted to another method.

6. Errors, Warnings and Messages

The package `mdframed` provides different errors, warnings and messages in the `log`-file. Some LaTeX-editors like TeXMaker or TeXStudio have a special tab for errors and warnings but not for messages. So you should look in the `log-File` itself.

The followings errors and warnings are generated by `mdframed`.

```
The package ...  does not exist but
 needed by mdframed
```

To avoid this problem you should install the required packages which are listed in section 2.

```
package option style is depreciated
use framemethod instead mdframed
```

With version 0.9d mdframed changed the meaning of the option style. The option is used to load a defined style by `\mdfdefinestyle`. Instead uses framemethod (see section 4.1).

```
Unknown framemethod .... mdframed
```

The input string for the option framemethod is unkown. See section 4.1.

```
You have not loaded ntheorem yet
```

To use the option ntheorem you have to load the package `ntheorem`.

```
You have only a width of 3cm
```

The package `mdframed` calculates the width of the contents based on the given options. If the width of the contents smaller than 3 cm you will get this warnings. You should change the settings to get a greater width.

```
You got a bad break
you have to change it manually
by changing the text, the space
or something else
```

Sometimes you have enough vertical space for the rules and the space between the rules and the contents but not for the contents itself. In this situation you will get this warning because the contents of this box is empty. You have the possibility to change the settings or include a `\clearpage` in front of the environment `mdframed`. So far I have no idea how to avoid such things.

```
You got a bad break
because the split box is empty
You have to change the page settings
like enlargethispage or something else
You got a bad break
```

See the explaation above.

```
You got a bad break
because the last split box is empty
You have to change the settings
```

The same reason as above but only in the last box.

```
Option ... is already consumed
and has no effect on input line ...
```

If you set a global option inside the document body you will get this warning.

7. 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`.

8. ToDo

1. see „Known Problems“.
2. So far it isn't possible to combine the environment `\begin{multicols}` of the package `multicol` with `mdframed` with the whole option list.
3. Create new styles.
4. Improve page breaks.
5. Improve footnotes
6. Improve documentation and create a separate pdf with examples
7. Create styles for frame title

9. Previous versions

If you have trouble with the new version of mdframed you can load `mdframedpre` instead. In this way you load the version v0.6 (see Revision history).

10. Acknowledgements

Dick Nickalls; Dietrich Grau; Piazza Luca Jobst Hoffmann.

Thanks for proofreading
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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` (done by `mdframed.sty`) the box will be set sequently (done by `md-frame-X.mdf`). The following figure demonstrates this.

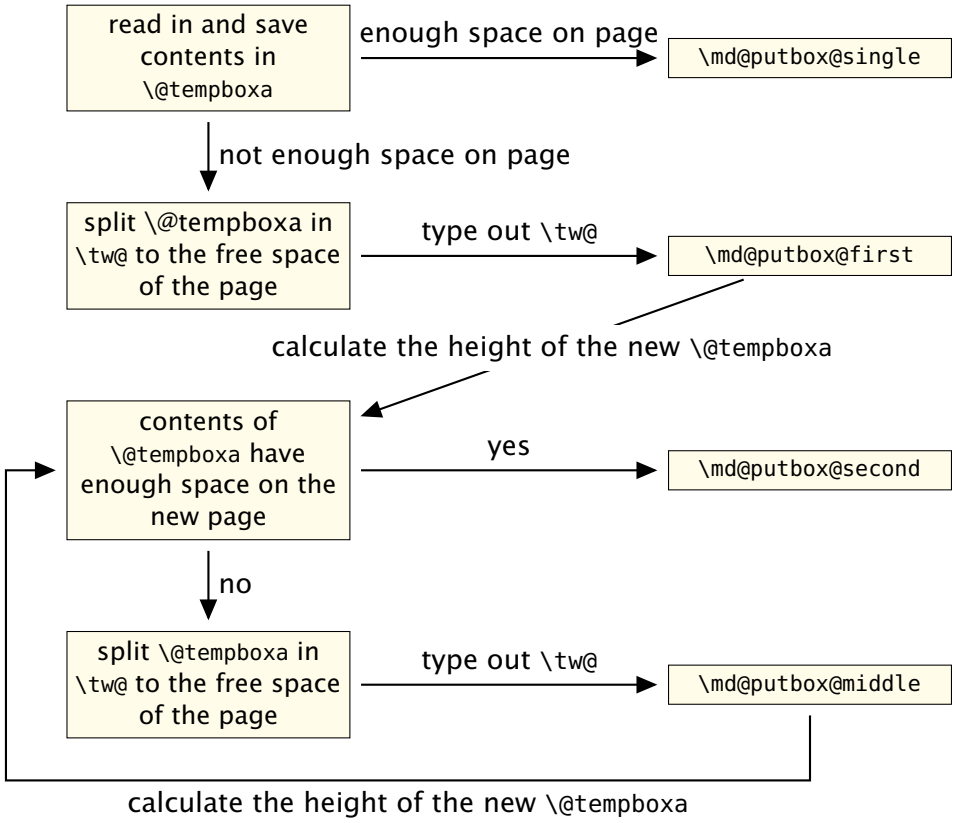

Figure 2: Setting the contents of `mdframed`

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 unspliot frame.

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

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

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

Using the explained commands we give an example. The command `\box` uses 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 framemethod to load the file by setting framemethod=X.

A.3. Revision history

Version 1.0 submitted 13 Nov 2011
• add option userdefinedwidth • add option align • add option apptotikzsetting • create new command `\mdfapptodefinestyle` • changed internal algorithm • removed calc instead using ε-TEX `\dimexpr` • expand documentation • trying to fixe problems with `xcolor` • fixed bug with framemethod=pstricks • create file `mdframed-example-default` • create file `mdframed-example-tikz` • create file `mdframed-example-pstricks` • create file `mdframed-example-texsx` (texsx stands for tex stackexchange)

Version 0.9g submitted 08 Oct 2011
• fixed documentation • added small footnote compatibility

Version 0.9f submitted 04 Oct 2011
• fixes bugs (thanks to Lars Madsen) • added option hidealllines • fixed documentation

Version 0.9e submitted 11 Sep 2011
• working with `twoside` modus

Version 0.9d submitted 10 Sep 2011
• changed the meaning of the option style!!! (inspired by Lars Madsen) • added option framemethod (inspired by Lars Madsen) • added options needspace (inspired by Lars Madsen) • added new command `\mdfdefinestyle` (inspired by Lars Madsen) • fixes documentation • renamed `md-frame-3.mdf` to `md-frame-2.mdf`

Version 0.9b submitted 7 Sep 2011
• fixes bugs in `\newmdtheoremenv` (Thanks to Enrico Gregorio)

Version 0.9a submitted 5 Sep 2011
• fixes bugs (Thanks to Lars Madson) • expanded documentation (added revision history)

Version 0.9 submitted 4 Sep 2011
• added option nobreak • detecting float environments to prevent split calculation • expand documentation (Thanks to Alan Munn)

Version 0.8a
• fixes bugs • fixes documentation

Version 0.8 submitted 22 Aug 2011
• added commands: `\newmdenv`, `\renewmdenv`, `\newmdtheoremenv` • fixes bugs • fixes documentation

Version 0.7a submitted 6 August 2011
• added option frametitle • added option frametitlefont • allow twolumn-mode • changed the calculation • added option tikzsetting • added options for hidden lines for all styles • fixes bugs

Version 0.6a submitted 22 Dec 2010
• fixes bugs • added `\mdfsetup` • expanded documentation

Version 0.6 submitted 18 Dec 2010
• added style=3 with `pstricks` • added option pstrickssetting • added option splitbottomskip • added option splittopskip • added options for hidden lines • changed the calculation • fixes bugs

Version 0.4a submitted 14 May 2010
• fixes bug in fontcolor

Version 0.4 submitted 13 May 2010
• Elke Schubert creates style file for `tikz` • fixes some bugs – calculation of the page dimen (thanks Dick Nickalls) • using tikz for the frame with different styles

Version 0.3b submitted 1 May 2010
• fixes some bugs – thanks to Dietrich Grau • added new options: ntheorem

Version 0.3a submitted 23 Apr 2010
• added new options: leftmargin and rightmargin • fixes some bugs

Version 0.3 submitted16 Apr 2010
• first upload to CTAN