

The cascade package

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1 Usage

- `\stepin` This command increases the depth (i.e. the number of parallel vertical lines) by one.
- `\stepout` This command decreases the depth (i.e. the number of parallel vertical lines) by one.
- `cascade (env.)` This environment needs to surround the `\stepin` and `\stepout` commands. It creates nested boxes, hence it **can only handle page-breaks if the depth is less equal 1!**

Example

```
usepackage{cascade} % needs cascade.sty!
begin{document}
begin{cascade}
  Initial thought
  \stepin
  First comment\\
  Second comment
  \stepin
  Comment on the above "Second comment"
  \stepin
  And another note on that last comment.\\
  The amount of lines is called "depth".
  \stepout
  Another comment on the "Second comment"
end{cascade}
end{document}
```

Initial thought

First comment
Second comment

Comment on the above "Second comment"

And another note on that last comment.
The amount of lines is called "depth".

Another comment on the "Second comment"

2 Implementation

```
1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage{cascade}[2024/12/19 v1.0 Vertical Lines with Indentation]
```

Note Important: Nested `tcolorbox` cannot do page-breaks!

Workarounds:

1. Use a standalone documentclass (infinite page-length):
e.g. `\documentclass[varwidth=170mm, border={2cm 2cm 2cm 2cm}]{standalone}`
2. Avoid more than 1 line for more than one page-height
3. *TODO*: find better workarounds.

2.1 Packages

loop through forgotten `\stepout` at the end of `cascade`-environment

```
3 \RequirePackage{forloop}
```

floating-point calculations for depth-dependent line thickness

```
4 \RequirePackage{fp}
```

Load `tcolorbox` for advanced box designs

```
5 \RequirePackage[most]{tcolorbox}
```

```
6 \makeatletter
```

2.2 Ideas for options

- `nolines` ... remove `borderline west` altogether
- `shiftwidth` ... make `left=2mm` arbitrary

2.3 Actual Implementation

Define a custom box style

```
7 \tcbuselibrary{skins}%Enable advanced options for tcolorbox
```

```
8 \tcbset{
```

```
9     mythickness/.store in=\borderthickness,%Define a key to store thickness value
```

```
10     custombox/.style={
```

```
11         enhanced,%Enable enhancements
```

```
12         frame hidden,%Hides top, right, bottom borders
```

```
13         borderline west={\borderthickness pt}{0pt}{black},%Add only the left border
```

```
14         left=2mm,%Horizontal shift from the content
```

```
15         right=0mm,%No shift on the right
```

```
16         top=1mm,%Minimal padding on the top
```

```
17         bottom=0mm,
```

```
18         boxsep=0mm,%Control internal margin between border and text
```

```
19         colback=white,
```

```
20         breakable,%breaks across pages
```

```
21     }
```

```
22 }
```

0-based counter of how deep down we are in the cascade:

```
23 \newcounter{d@pth}
```

`\setthickn@ss` Calculate thickness from reciprocal `d@pth`:

```
24 \newcommand{\setthickn@ss}{\FPeval\borderthickness{round(3/(\thed@pth+1), 2)}}}
```

`\stepin` 2.4 level-controlling user command definitions

go one deeper (i.e. add one vertical line)

```
25 \newcommand{\stepin}{\stepcounter{d@pth}\setthickn@ss\begin{tcolorbox}[custombox]}
```

`\stepout` exit one level (i.e. delete one vertical line for everything below the command)

```
26 \newcommand{\stepout}{\end{tcolorbox}\addtocounter{d@pth}{-1}\setthickn@ss}
```

for loop variable

```
27 \newcounter{i@}
```

cascade (*env.*) 2.5 the main environment

```

28 \newenvironment{cascade}[0]{%
indentation looks bad inside so we set it 0 inside
29   \let\oldparindent\parindent
30   \setlength{\parindent}{0pt}
reset d@pth counter
31   \setcounter{d@pth}{0}
32 }%end cascade initial block
33 {%
taking care of forgotten \stepout's
34 \forloop{i@}{0}{\value{i@} < \value{d@pth}}{\end{tcolorbox}}
reset parindent length to the value outside
35 \setlength{\parindent}{\oldparindent}
36 }%end cascade final block
37 \makeatother
38 \endinput

```

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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.

```

addtocounter= \subitem FPaddtocounter+ \hdclindex{35}{code}{26},34
begin= \subitem **\begin+ \hdclindex{33}{code}{25},5
borderthickness= \subitem **\borderthickness+ \hdclindex{15}{code}{13}+\setcounter+, \hdclindex{24}
makeatletter= \subitem **\makeatletter+ \hdclindex{12}{code}{6}
makeatother= \subitem **\makeatother+ \hdclindex{47}{code}{37}
cascade=cascade stepcounter= \subitem **\stepcounter+, \hdclindex{24}
(env.), 1, 28 NeedsTeXFormat= \subitem **\NeedsTeXFormat+\stepcounter+ \hdclindex{21}
newcounter= \subitem **\newcounter+ \hdclindex{29}{code}{17}
end= \subitem **\end+ \hdclindex{35}{code}{26},34
endinput= \subitem **\endinput+ \hdclindex{48}{code}{38}
environments;cascade=cascade, tcbselibrary= \subitem **\tcbselibrary+,
1, 28 parindent= \subitem **\parindent+ \hdclindex{39}{code}{28},30
35
forloop= \subitem **\forloop+ \hdclindex{44}{code}{34}

```