

# 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

<code>begin{cascade}</code>	Initial thought
Initial thought	
<code>\stepin</code>	First comment
First comment <code>\</code>	Second comment
Second comment	
<code>\stepin</code>	Comment on the above "Second comment"
Comment on the above "Second comment"	
<code>\stepin</code>	And another note on that last comment.
And another note on that last comment. <code>\</code>	The amount of lines is called "depth".
The amount of lines is called "depth".	
<code>\stepout</code>	Another comment on the "Second comment"
Another comment on the "Second comment"	
<code>end{cascade}</code>	

## 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

```

## Index

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, tcbuslibrary= \subitem **\tcbuslibrary+,
1, 28 parindent= \subitem **\parindent+ \hdclindex{39}{code}{28},30
35
forloop= \subitem **\forloop+ \hdclindex{44}{code}{34}

```