

# The Dark Sorcery of Minipages

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For understanding how minipages behave, it is helpful to have some additional text in a document, such as this. The tricky thing about minipages is usually to get them to align nicely in the vertical dimension. So, let us create some minipages, and see what they do.

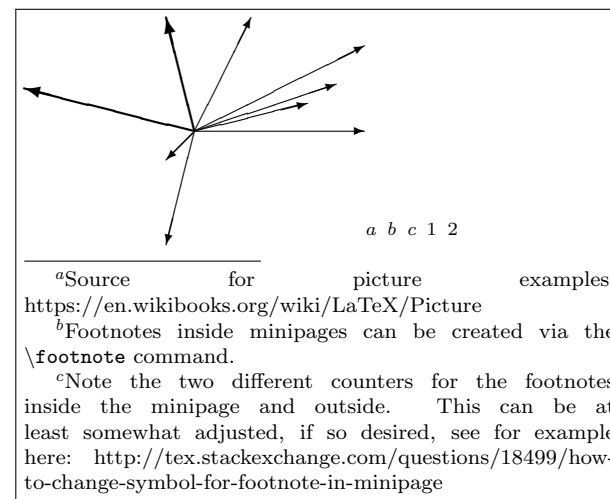
We are now inside a minipage which was created by `\begin{minipage}{0.45\textwidth}`.

As you perhaps suspect, the content of the two minipages on this page is vertically centered with respect to the minipages.

Also note that inside minipages, the `\parindent` dimension is set to zero by default. You can still set it to anything you like by using the usual `\setlength{\parindent}{<length>}` syntax...

...as was done right before starting this paragraph. In fact, the `\parindent` length is now (i.e. right from the start of this paragraph) set to its original value. This was accomplished by first creating a new length: `\newlength{\parindentBackup}`, and then storing the value of `\parindent` in that length *before* the minipage was opened, via: `\setlength{\parindentBackup}{\parindent}`. Then `\parindent` was restored to its original value before the start of this paragraph.

Lastly, you may have noticed that the minipage itself is indented with respect to regular text on the page. That is because it is basically the starting element of a paragraph, and as such `\parindent` was applied to it before the minipage was started. We will fix this on the next page.



<sup>1</sup>We can also put footnotes outside the minipage via the `\footnotemark` – `\footnotetext` syntax, optionally with an additional numeric index: `\footnotemark[1]` and `\footnotetext[1]{text}`. Using this syntax inside the minipages has not produced reliable results for the author though. Beware of dragons.

<sup>2</sup>Also note that hyperlinks to footnotes outside the minipage are broken.

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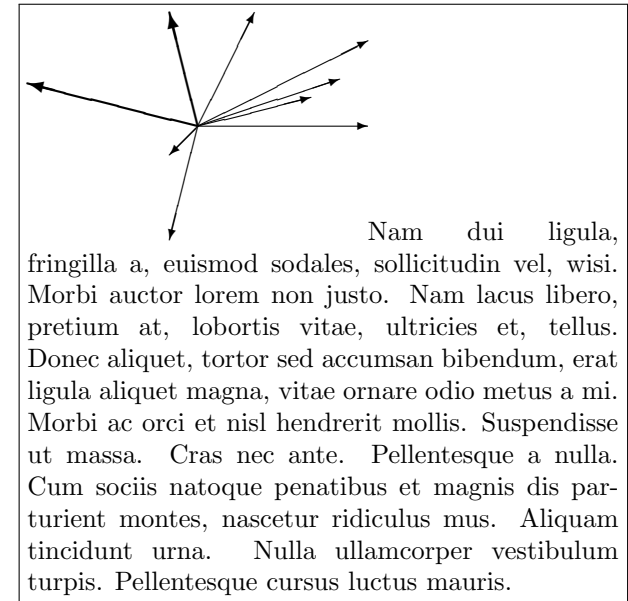
As can be seen when comparing the alignment of this minipage's content with the dummy text right above, the minipage is now not indented with respect to the rest of the text of the page. This was achieved by preceding the minipage command with `\noindent`. This will also work for any other paragraph, should you so wish (though usually it is not recommended).

Anyway, enough about indentation: Maybe you think that aligning the picture on the right in reference to the vertical center lines of the minipages is not what you want. Maybe you want the picture to be aligned with the top of the first minipage?

Easier said than done! But alright: First things first. Have a look at the minipage on the right. Notice anything? The picture seems to be more aligned like a letter than a picture, or not? The picture's bottom is on the same height as the bottom of the letters on the first line. That actually has little to do with the minipage environment, but it is important to know for getting things aligned as we (okay,  $\text{jem}_i\text{I}_i/\text{em}_i$ ) want later on.

Now, if I may direct your attention to that red reference line in the middle of the page. The reference line is outside the minipages, meaning it is part of the regular text flow. Note that it is in the vertical center of the two minipages.

This is the reference line!

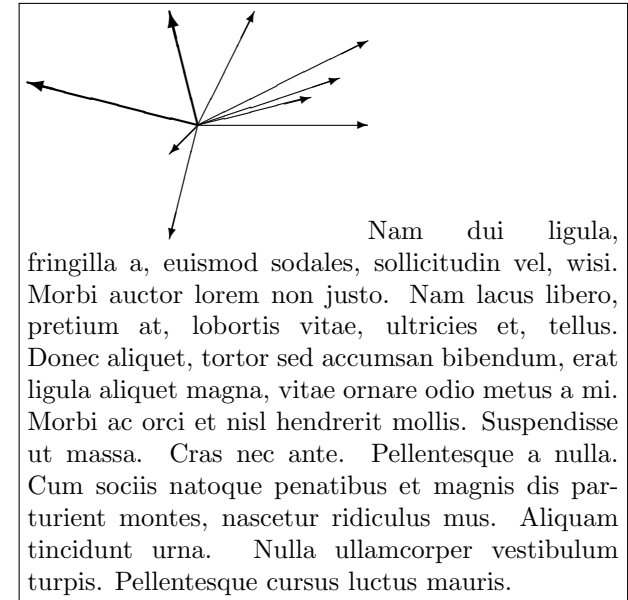


This is what happens when you create a minipage environment (well, two, to be precise) with the optional argument for top alignment, like so: `\begin{minipage}[t]{0.33\textwidth}`

Note that each minipage's first line is aligned with the reference line now. However, because the picture's bottom is aligned with the bottom of the minipage's first line, and thus with the bottom of the reference line, this is not exactly what I'd call a desirable outcome.

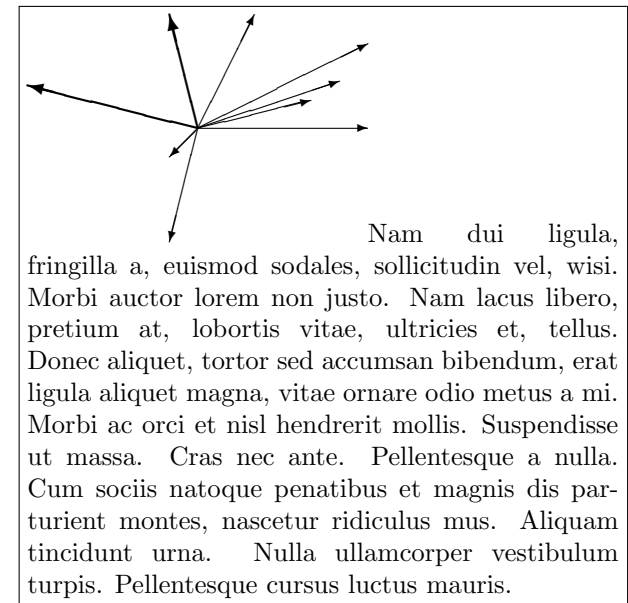
We can also call a minipage with the `[c]` (for center alignment, which is also the default which gets called when you don't specify an optional alignment parameter) or `[b]` (for bottom alignment).

This is the reference line!



This can actually be used for some rather odd placement configurations, like on this page, where the left minipage was created by calling `\begin{minipage}[t]{0.33\textwidth}` for top alignment, and the right one was created by `\begin{minipage}[b]{0.33\textwidth}` for bottom alignment.

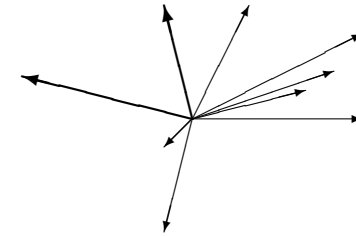
This is the reference line!



But enough about that. What about getting that picture to align in a sane manner? That requires some more optional arguments. To be more precise: `\begin{minipage}[t] [] [b]{0.33\textwidth}` Okay, don't panic. The first argument `[t]` is the top-alignment one from before. Nothing new there. The middle one is the minipage's height. Note that while it is empty in this case (and in most other cases, because usually we don't care to manually calculate how high our minipage is going to be), but it must be there if you want to have the last option, `[b]`. That last optional argument tells the minipage to align the top of the first line with the bottom of the baseline.

Personally, I still find this to be a bit off from perfection. Ideally, the top of the picture should be aligned with the top of the reference line, in my humble opinion.

This is the reference line!



Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

So let's try that then. First, we create the left minipage with

```
\begin{minipage}[t][t]{0.33\textwidth}
```

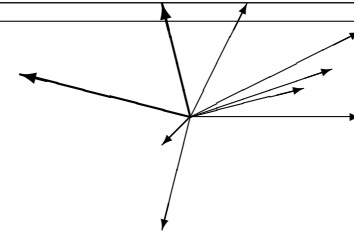
Thus aligning its top line perfectly to the reference line.

The second minipage's content (not the minipage itself, as you can see by the frame) is shifted by negative 1em via `\vspace{-1em}` by placing that command inside the minipage (see the example without the frameboxes below). This means that its content slightly protrudes above the minipage. Whether or not you care about that is up to you.

Note that the top of the picture is aligned with the top of the reference *line*, not its letters. In the end, how you wish to align this is up to you.

The next page is the same as this one, but without all the lines, so that it is easier to get an impression of how it would look in an actual document.

This is the reference line!



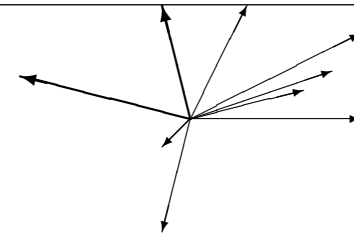
Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Alternatively to inserting a negative vshift, we can also use a `\raisebox` command to raise the entire minipage upwards.

Note that the top of the left minibox is aligned with the top of the drawing, but not with the top of the right minipage.

If we leave out the rules and frameboxes, we can see on the next two pages that the result is the same.

This is the reference line!



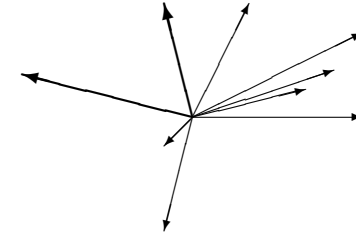
Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

As promised, the same alignment options, but without the visual clutter.

The right minipage on this page is created by:

```
\begin{minipage}[t][b]{0.33\textwidth}
  \vspace{-1em}
  \begin{center}
    \arrows
  \end{center}
  \lipsum[2]
\end{minipage}
```

This is the reference line!



Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.



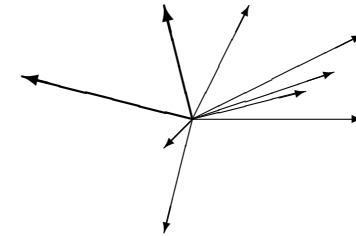
Alternatively to inserting a negative `vshift`, we can also use a `\raisebox` command to raise the entire minipage upwards.

The right minipage in this case works as follows:

```
\raisebox{1em}{%
  \begin{minipage}[t] [] [b]{0.33\textwidth}
    \begin{center}
      \arrows
    \end{center}
    \lipsum[2]
  \end{minipage}}
```

If you overlay this page and the previous one, they should be visually indistinguishable. So which approach you prefer is up to you. The usage of the `\raisebox` command is the cleaner approach in the author's opinion, but whether the reader holds the author's opinion in sufficiently high regard to agree with that argument is yet to be determined.

This is the reference line!



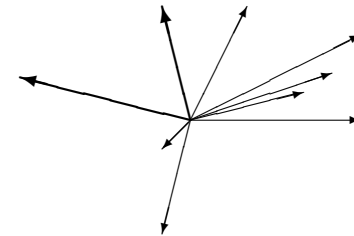
Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

If the minipages on both sides open with text, the command as used earlier produces the more pleasing result I'd say, by aligning both top lines of the minipages with the reference line. The commands as used on this page are:

```
\begin{minipage}[t] [] [t]{0.33\textwidth}
```

This is the reference line!

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.



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A minipage will never be broken across different pages, and will therefore happily flow beyond page margins in both the horizontal and vertical direction, or even wander right off the page itself.

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In theory, minipages can be used at arbitrary places inside text, like on. this page.

This minipage is center-positioned, without any optional arguments.

Whether or not this yields a desirable outcome

is left as an exercise to the reader. Placing minipages randomly inside flowing text can yield some rather odd results, after all, as can easily be seen here.

This minipage is top-positioned, via a single [t] argument.

Now let us continue to write some random text in order to create some words with which to fill this page so that we can see more minipage

This minipage is bottom-positioned by the single [b] argument. Also, it has more text in it than the two previous ones, so that it grows a bit taller. But it's also a bit wider, because why the hell not.

behavior.

And let's make another one right next to it.

Though it might show up on a different place due to line breaks and all that stuff. Also, that one was

aligned via [t] [] [b], as you may have guessed if you've been paying attention.

Whereas this one has been positioned via [t] [] [t].

The difference should not be too difficult to spot.