LaTeX Spacing Tricks

K. Cooper

2012

Boxes

- Inviolable space required by some typsetting element
- Could be one letter

-
- Has *baseline*, *height*, *width*, and *depth*
- Tricks for slanted styles

Glue

- Boxes are pasted together with *glue*
- Stretchable/shrinkable space
- Letters get glued together . . .
- Words are then glued together
- Then lines...
- Note that spaces are uniform horizontally & vertically
- The glue stretches to fill the allotted space
- The glue stretches to fill the space

Modes

- Horizontal Mode – form letters into words, words into lines, lines into paragraphs.
- Vertical Mode – divide paragraphs into lines and form these, math, and other objects into pages.
- Math Mode – Obvious
- Subtleties: Internal vertical mode, restricted horizontal mode, display math mode
- Horizontal mode, restricted   horizontal   mode, and now back to horizontal mode

Modes Matter

- Sometimes important to know what mode T_EX is in
- `\hspace` takes place in horizontal mode
- `\vspace` delayed until vertical mode takes over

Example

\indent\vspace{.5in} At the indentation of this sentence,
\TeX\ went into horizontal mode.   There is some
display math mode here too:
$$\vspace{.5in}x_{\pm} =
-\frac{b}{2a}\pm\frac{\sqrt{b^2-4ac}}{2a}.$$
\TeX\ typesets the entire
paragraph into lines, but can only use the \tc{vspace}
commands when in vertical mode, putting the lines
together into a page.

Example

At the indentation of this sentence, TEX went into hori-

zontal mode. There is some display math mode here too:

$$x_\pm = -\frac{b}{2a} \pm \frac{\sqrt{b^2 - 4ac}}{2a}.$$

TEX typesets the entire paragraph into lines, but can only use the \vspace commands when in vertical mode, putting the lines together into a page.

Spaces

- Basic space is \␣: backslash-space
- Provides a stretchable space, i.e. extra glue
- There are four extra spaces   here.
- There are four extra spaces here. This line is only for comparison. Observe that the four extra spaces took up the space of three characters.
- Use ˜ for a fixed-width unbreakable space, e.g. for use in names: K.˜ D.˜ Cooper

More spaces

Stretchable spaces – use anywhere

\␣	O	O
\quad	O	O
\qquad	O	O

Math mode spaces

\!	OO	
\,	$O\,O$	
\;	$O\;O$	

Arbitrary size spaces

- `\hspace{`*length*`}` makes a horizontal space. Use anywhere.
- There is a `\hspace{1in}` before this. There is also a `\hspace{1in}` after "this". Use `\hspace*` to force space even at line breaks.
- `\vspace{`*height*`}` makes a vertical space. Use in vertical mode.

- There was a `\vspace{.6in}` at the end of the previous line.
- Use `\vspace*` to force space even at a page break.

Fixed vertical spaces

- `\smallskip` – a small vertical space: follows this line.

- `\medskip` – a medium vertical space: follows this line.

- `\bigskip` – a big vertical space: follows this line.

- Equivalent to e.g. `\vspace{\medskipamount}`
- Can change these amounts: `\medskipamount=20pt`

Fills

- Infinitely stretchable/shrinkable space
- \hfill can fill a line, e.g.
- left   right
- Likewise, \hrulefill fills with a line, \dotfill fills with dots.
- left . . . . right
- \vfill does same in vertical
- Beware: if the box has variable width or height, the fills will default to zero length.

Margins

- Remember that TeX was designed for producing books. We might need to leave paper for binding.
- `\evensidemargin` – left margin for even numbered pages
- `\oddsidemargin` – left margin for odd numbered pages
- `\textwidth` – width of text area. The right margin is whatever is left over.
- `\topmargin`, `\textheight` control vertical text area.
- We usually set these in the preamble.

Margins

- Remember that TeX was designed for producing books. We might need to leave paper for binding.
- `\evensidemargin` – left margin for even numbered pages
- `\oddsidemargin` – left margin for odd numbered pages
- `\textwidth` – width of text area. The right margin is whatever is left over.
- `\topmargin`, `\textheight` control vertical text area.
- We usually set these in the preamble.

Margins

- Remember that TeX was designed for producing books. We might need to leave paper for binding.
- `\evensidemargin` – left margin for even numbered pages
- `\oddsidemargin` – left margin for odd numbered pages
- `\textwidth` – width of text area. The right margin is whatever is left over.
- `\topmargin`, `\textheight` control vertical text area.
- We usually set these in the preamble.

Margins

- Remember that TeX was designed for producing books. We might need to leave paper for binding.
- `\evensidemargin` – left margin for even numbered pages
- `\oddsidemargin` – left margin for odd numbered pages
- `\textwidth` – width of text area. The right margin is whatever is left over.
- `\topmargin`, `\textheight` control vertical text area.
- We usually set these in the preamble.

Margins

- Remember that TeX was designed for producing books. We might need to leave paper for binding.
- `\evensidemargin` – left margin for even numbered pages
- `\oddsidemargin` – left margin for odd numbered pages
- `\textwidth` – width of text area. The right margin is whatever is left over.
- `\topmargin`, `\textheight` control vertical text area.
- We usually set these in the preamble.

Margins

- Remember that TeX was designed for producing books. We might need to leave paper for binding.
- `\evensidemargin` – left margin for even numbered pages
- `\oddsidemargin` – left margin for odd numbered pages
- `\textwidth` – width of text area. The right margin is whatever is left over.
- `\topmargin`, `\textheight` control vertical text area.
- We usually set these in the preamble.

```
\oddsidemargin=1.5in
\setlength{\oddsizemargin}{1.5in}
```

Variables

- Point is that certain *variables* control page size and position.
- `\parskip` – distance between paragraphs
- `\parindent` – indentation at beginning of paragraph
- `\baselineskip` – distance between baselines of text lines
- Some of these can be reset by environments. In particular, `\baselineskip` is set by document environment, so to change it, you must do so *inside* the document.

Making boxes

- Sometimes you need to set text in a fixed area.
- `\makebox[`*width*`]{`*content*`}` sets *content* in a box of width *width*.
- `\makebox[.8\textwidth]{\hrulefill This is officially .8\textwidth wide}`.
- ――――――――This is officially .8`\textwidth` wide.
- N.B. you can specify lengths as a number times a variable, where multiplication is denoted by adjacency.

Other boxes

- If you want to see the box, you can use a \framebox
  To make a box that uses
- multiple lines, use e.g..
  \parbox{2.0in}{...}

- To make a box that is vertically aligned $^{\text{off}}$ the $^{\text{base}}$line,
  use \raisebox{2ex}{...}. Positive lengths denote
  raising the box above the baseline; negative lengths put
  the base of the box below the baseline.

Rules

- You can make a rectangular blob of ink using `\rule`.
- `\rule{1in}{.2mm}` gives ————————.
- `\rule{.1in}{.5\baselineskip}` gives ■.
- Making a rule of 0 thickness can be a good way of forcing space in horizontal or math mode. Such a rule is called a *strut*.
- This line has a strut: `\rule[-.25in]{0in}{.5in}`

- The optional length moves the strut down from the baseline by a quarter inch.
- `\strut` gives a strut as tall as the default line height.