Introduction to Scientific Typesetting
Lesson 2: Typing Text

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An Overview

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Packages

Loading Packages

"Packages" are add-ons to LaTeX that can greatly extend its flexibility and your options. They are called in the preamble of your document with the command

`\usepackage[`*options*`]{`*packagename*`}`

Most packages come with documentation, which tells you how to use the package properly. Find the relevant folder here:

`C:\Program Files (x86)\MiKTeX 2.9\doc\latex`

Let's open the documentation for `geometry` (`geometry.pdf`) as an example.

Packages in the Lab

Believe it or not, *every single LaTeX package* has been loaded onto your computer in this lab!

So, accessing LaTeX packages in the lab should be easy.

It will be different on your own machine.

Acquiring Packages Elsewhere

If you run MiKTeX, the easiest way to get a package onto your computer is to use the “Package Manager” program. (Go to the Start Menu, find the MiKTeX 2.9 folder, then Maintenance, then Package Manager.)

Once you find something there, MiKTeX will grab it and “refresh” your database.

Another way to get a package is to poke around on `http://www.ctan.org`. This is a central repository for LaTeX packages.

Finally, if you call a package in your preamble and it isn’t on your computer, LaTeX will either download and install it automatically, throw an error, or ask you if you’d like to download and install it. (It all depends upon the options you chose when installing MikTeX on your machine.)

The `geometry` Package

The `geometry` package controls the margins and page layout for your documents. It is *very* useful.

A lot of the commands for the `geometry` package are straightforward. See all of them in the documentation.

These are all examples of options for the `geometry` package.

Example	Description
`margin=1in`	1-inch margins
`top=1.5in`	1.5-inch top margin
`height=8in`	8 vertical inches of text
`width=4in`	4 horizontal inches of text

The `geometry` package is good at arithmetic, so you won't have to specify everything.

A `geometry` example

Let's create a quick file to test out this package.

```
\documentclass{article}
\usepackage[margin=1in]{geometry}
\begin{document}
Hello, world!
\end{document}
```

Now play around with the options above. Use `left`, `right`, `top`, `bottom`, or `margin`. To specify more than one option, separate them within the square brackets by commas (ex: `[top=3in,right=3.5cm]`). Remember to include a unit of measurement!

The `setspace` Package

You've probably noticed that LaTeX typesets everything single-spaced by default. This is actually quite challenging to change without the aid of the `setspace` package.

Put `\usepackage{setspace}` in your preamble. Then use the `spacing` environment to change the spacing.

```
\begin{spacing}{2}
...
\end{spacing}
```

The mandatory argument is the spacing you desire. Most numerical values are fair game.

Note on `setspace`: This package is *really* easy to use, so there isn't much documentation to speak of. It's commented out in the `.sty` file.

Let's practice!

Open up the first example PDF file from Sakai, and reproduce it.

Formatting and Positioning Text

Text Decorations

Short changes to the way your text looks (italics, bold, etc.) require *commands* in LaTeX.

Command	Effect
`\textbf{This is bold}.`	**This is bold**.
`\textit{This is italic}.`	*This is italic*.
`\emph{This is emphasized}.`	*This is emphasized*.
`\underline{Underlined}.`	Underlined.
`\textsc{Small caps}.`	SMALL CAPS.
`\textrm{Roman}.`	Roman.
`\textsf{Sans Serif}.`	Sans Serif.
`\textsl{Slanted shape}.`	*Slanted shape*.
`\texttt{Typewriter type}.`	`Typewriter type`.

Commands like this can be **nested**.

Commands and Declarations

For text changes that stretch on for longer periods of time, use *declarations* instead of commands.

Instead of `\textbf{Bold text}` use `{\bfseries Bold text}`

or as an environment: `\begin{bfseries}`.

Here is the correspondence:

Command	Declaration	Command	Declaration
`\textrm`	`\rmfamily`	`\textsf`	`\sffamily`
`\texttt`	`\ttfamily`	`\textmd`	`\mdseries`
`\textbf`	`\bfseries`	`\textup`	`\upshape`
`\textit`	`\itshape`	`\textsl`	`\slshape`
`\textsc`	`\scshape`	`\emph`	`\em`

Text Decorations with `soul`

You can do other cool things to text by loading the `soul` package. (You will need to load the `color` package too.)

- strikethrough `\st{...}`

  Example: I went to the ~~doctor's~~ dentist's office this morning.

- highlighting `\hl{...}`

  Example: Color can be used for emphasis instead of italics.

- underlining `\ul{...}`

  Example: Underlining is not used very frequently for emphasis.

- letterspacing `\so{...}`

  Example: Letterspacing makes some text look f u n n y.

Changing colors for `soul`

You can change the strikethrough, highlighting, and underline colors.

`\setstcolor{red}`	Makes the ~~strikethrough~~ red.
`\sethlcolor{green}`	Makes the highlight color green.
`\setulcolor{orange}`	Makes the underline color orange.

Text Justification

Environments are necessary to change the standard full justification that LaTeX uses.

Environment	Effect
`center`	Centered text
`flushright`	Right justification
`flushleft`	Left justification

Example:

```
\documentclass{article}
\begin{document}
\begin{center}
Hello, world!
\end{center}
\end{document}
```

Footnotes

LaTeX handles footnotes beautifully.

```
\documentclass{article}
\begin{document}
\underline{War and Peace} is a great
book.\footnote{Actually, I haven't read it.}
\end{document}
```

Accents

If you need accented characters, like from a different language, you'll need some special commands.

Command	Effect
`\"{a}`	ä
`\'{e}`	é
`\^{o}`	ô

Consult the guide posted on Sakai for a full list.

Ellipses

type: `It was the best of times, \dots`

see: It was the best of times, ...

Let’s practice!

Open up the second PDF file posted on Sakai and reproduce it.

Font Sizes

The Size Option

All of LaTeX's font size adjustments are set based upon the *normal* size for the document.

1. The default text size for a document is 10 point.
2. To make a change, use an optional argument on the `\documentclass` command.

```
\documentclass[12pt]{article}
```

3. Permitted font sizes for the `article` class: 9, 10, 11, 12.

Changing Sizes

From smallest to largest:

Command
\tiny
\scriptsize
\footnotesize
\small
\normalsize
\large
\Large
\LARGE
\huge
\Huge

Two Examples

An example of changing font sizes within a document.

type: `These \large words \Large get \LARGE big.`

see: These words get big.

Another example:

type:
```
Lots \huge of different
\small sizes \tiny of \normalsize text.
```

see: Lots of different sizes of text.

Units of the Document

Breaking Lines

There are three ways to get a new line of text.

1. Insert a blank line in the `.tex` file. This produces a new *paragraph*.
2. Use the `\\` command. Text after the double backslash will appear on the next line, without any indentation. (Make sure you have a space in the `.tex` file after the `\\` to achieve this.)
3. Use `\newline`. This functions the same way as `\\`.

Most prefer `\\` because of this added functionality:

Command	Effect
`\\[length]`	creates interline space of `length`
`\\*`	prevents page break after line
`\\*[length]`	combination

An Example

Type:

```
I think we should continue
this conversation \\[.3in] down here.
```

See:

I think we should continue this conversation

down here.

Acceptable units of measurement: `in`, `cm`, `pt`

Breaking Paragraphs

We've seen that a blank line in your file produces a new paragraph. Sometimes you might not want this paragraph indented. (It is indented by default.)

Use the command `\noindent` before the first line of the next paragraph.

```
\documentclass{article}
\begin{document}
This is indented.

\noindent This is not.
\end{document}
```

Breaking Pages

This command is exactly what you might expect now:

```
\newpage.
```

Everything after this command will appear on the next page. That new paragraph will be indented.

Let’s practice!

Open up the third PDF file posted on Sakai and reproduce it.

Spaces

Horizontal Space

We've learned about `\␣` and `\,` as ways to add horizontal space.

We'll mainly use the `\hspace` command:

Command	Result
`\quad`	| |
`\qquad`	| |
`\hspace{8pt}`	| |
`\hspace{.6in}`	| |
`\hspace{1.2cm}`	| |

Horizontal space can be negative if needed.

Vertical Space

The analog to `\hspace` is `\vspace`.

LaTeX adds vertical space after the typeset line in which that command appears.

This means that `\vspace` commands should usually be on their own line in the `.tex` file.

Filling Space

- `\hfill` fills available space in the line with blank space
- `\vfill` fills available space on the page with blank space

Example:

```
\documentclass{article}
\begin{document}
\noindent The top. \\[.1in]
The left \hfill and the right.
\vfill
The bottom.
\end{document}
```

Boxes Around Text

Framed Boxes

An added text effect can be achieved by framing text.

Like this!

```
\fbox{Like this!}
```

Restriction: You cannot break a line within `\fbox`.

Paragraph Boxes

The text within a paragraph box works just like a paragraph, except that the author sets the width.

```
\parbox{2in}{The text within...sets the width.}
```

You can accomplish the same thing with the `minipage` environment.

Syntax
`\parbox{width}{text}`

`\begin{minipage}{width}`
text
`\end{minipage}`

A Combination

As you can see, we can combine these techniques together to form a boxed paragraph of any width we choose.

```
\fbox{\parbox{2in}{As you can...we choose.}}
```

As you can see, we can combine these techniques together to form a boxed paragraph of any width we choose.

```
\fbox{\begin{minipage}{2in}

As you can ... we choose.

\end{minipage}}
```

Background Colors

We can also change the background color for a paragraph box:

Look at this yellow box. Look at this yellow box. Look at this yellow box. Look at this yellow box.

```
\colorbox{yellow}{\parbox{2in}{...}}
```

If you want this to happen within a document, you'll need to use a width of `\textwidth` within the parbox. (Alternatively, the `minipage` environment can be used in place of the `parbox`.)

Let’s practice!

Open up the fourth PDF file posted on Sakai and reproduce it.