

Beginner's L^AT_EX Tutorial

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lots borrowed from Marius

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Outline

Why Latex

Basics

Tools

Features

- Math Mode

- Lists

- Tables

- Figures

- Numbering

- References

- Bibliographies with BibTeX

Using Latex Packages

Resources

- ▶ **Goal** —Get beginners familiar with using latex

caveat

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- ▶ focus on demos – lots of references online
- ▶ I will not cover advanced features

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- ▶ Pretend to be a theory student

The Good, The Bad, ...

😊	😞
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☹️ Latex can be very intimidating ☹️

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~~😊 Latex can be very intimidating 😞~~

😊 Hopefully this talk will help 😊

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Latex Commands

Two basic forms:

1. `\SomeCommand{AnArgument}`

2. `\begin{SomeEnvironment}`

...

`\end{SomeEnvironment}`

`\documentclass` [arguments] {type of document}

package imports

global definitions

other settings

`\begin`{document}

document contents: text, LATEX commands

`\end`{document}

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Latex Tools

Tools exist for most platforms to make working with latex easier:

- ▶ makefile
- ▶ mode for emacs
- ▶ IDEs for every platform

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I will demo TexnicCenter, an IDE for windows

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More options listed in Resources at the end

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By default, LaTeX is in “text” mode. Have to switch to math to use math mode:

- ▶ Use $\$ \dots \$$ in the middle of a text-block

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- ▶ Use
$$[\dots]$$
 to insert a block of math

Math Mode

By default, LaTeX is in “text” mode. Have to switch to math to use math mode:

- ▶ Use `$... $` in the middle of a text-block
- ▶ Use `\ [... \]` to insert a block of math
- ▶ Use `\begin{align} ... \end{align}` to have aligned equations

Lists

```
\begin{itemize}  
  item ...  
  item ...  
\end{itemize}
```

can use enumerate instead of itemize

Tables

Tables

```
\begin{table}  
\centering
```

```
\end{table}
```

Tables

```
\begin{table}  
  \centering  
    \begin{tabular}{ }  
    
```

```
    \end{tabular}
```

```
\end{table}
```

Tables

```
\begin{table}  
  \centering  
    \begin{tabular}{|c|r}
```

```
  \end{tabular}
```

```
\end{table}
```

Tables

```
\begin{table}
\centering
  \begin{tabular}{|c|r}
    Height & Weight \\

  \end{tabular}

\end{table}
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  \begin{tabular}{|c|r}
    Height & Weight \\
    \hline

  \end{tabular}

\end{table}
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Tables

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\begin{table}
\centering
\begin{tabular}{|c|r}
Height & & Weight \\ \hline
5.4 & & 160 \\
\end{tabular}

\end{table}

\end{table}
```

Tables

```
\begin{table}
\centering
\begin{tabular}{|c|r}
Height & & Weight \\
\hline
5.4 & & 160 \\
6.1 & & 234 \\
\end{tabular}
\end{table}
```

Tables

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\begin{table}
\centering
\begin{tabular}{|c|r}
Height      &      Weight \\
\hline
5.4         &      160 \\
6.1         &      234 \\
\end{tabular}
\caption{Some text that is a caption for the table}
\label{tableLabel}
\end{table}
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Height	Weight
5.4	160
6.1	234

Table: Some text that is a caption for the table

Adding figures to your documents

Use the `graphicx` package

```
\begin{figure}  
  \centering  
    \includegraphics{filename}  
    \caption{the caption text}  
    \label{label for cross-refs}  
\end{figure}
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```

- ▶ With latex → ps → PDF, can only use postscript graphics
- ▶ With latex → pdf, can use anything but postscript (pdf, jpgs, png, tiff)

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Often adding a * to the end of a command will turn off auto-numbering:

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```
\begin{align*}
x \quad &= \quad 1 + 1 \quad \backslash\backslash \\
&= \quad \quad \quad 2 \quad \backslash\backslash \\
\end{align*}
```

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$$x = 1 + 1 \tag{1}$$

$$= 2 \tag{2}$$

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vs:

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$$x = 1 + 1$$

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1. Use `\label{aLabelName}` in your figures and tables

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Example: Here is a reference to Table 1.

See BibTeX

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Latex Packages

- ▶ LOTS of great functionality in packages (for example, including graphics)
- ▶ MikTeX has a built in package manager — very useful.
- ▶ see here (<http://www.math.uiuc.edu/hildebr/tex/customstyles.html>) for doing it manually. (sorry this isn't a very good answer ... if you really need to do this, I'd suggest first trying to find somebody that does this themselves, I always use a package manager.)

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Using Make (from Marius)

```
SOURCES=$(wildcard *.tex)
all: pdf
pdf: $(SOURCES:.tex=.pdf)
ps: $(SOURCES:.tex=.ps)
dvi: $(SOURCES:.tex=.dvi)
%.dvi: %.tex
    latex $<; latex $<
%.ps: %.dvi
    dvips $< -o $@
%.pdf: %.ps
    ps2pdf $<
```

Building PDFs becomes a matter of

```
$ make hello.pdf
```

assuming that hello.tex exists.

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6. Use the other grad students

Useful Packages

- ▶ **amsmath** — gives the `align` command plus other useful stuff
- ▶ **amsthm** — lemma, etc.
- ▶ **algpseudocode**, **algorithm** — code formatting
- ▶ **graphicx** — inserting figures (eps, jpg, png, etc.) into your latex documents
- ▶ **subfig** — organizing subfigures
- ▶ **hyperref** — putting links into your pdfs
- ▶ **beamer** — slides.
- ▶ **prospcr** — more slides (provides transitions, but I think beamer is easier). here (<http://prospcr.sourceforge.net/>). Nice collection of documentation (<http://amath.colorado.edu/documentation/LaTeX/prospcr/>).
- ▶ **multirrow** — spanning rows and columns in tables
- ▶ **wasysym** — some extra symbols (smileys)

Useful Resources

- ▶ **cheat sheet** — (<http://www.stdout.org/winston/latex/>)
- ▶ **Latex primer** — <http://www.maths.tcd.ie/%7Edwilkins/LaTeXPrimer/>
- ▶ (<http://www.math.uiuc.edu/hildebr/tex/>) bunch of tips, mostly focused on theorems, etc.
- ▶ **help page #1** — (<http://web.image.ufl.edu/help/latex/>) good as a beginners reference
- ▶ **help page #2** — (<http://www-h.eng.cam.ac.uk/help/tpl/textprocessing/TeX/latex/latex2e-html/ltx-2.html>) good if you know the command name
- ▶ **Bibtex reference** — (<http://amath.colorado.edu/documentation/LaTeX/reference/faq/bibstyles.html>)
- ▶ Random blog (<http://andrewjpage.com/index.php?/categories/2-Latex>) with some handy tips
- ▶ **Google** —

Useful Tools

- ▶ **MikTeX** — (<http://miktex.org/>) latex distribution + package manager
- ▶ **TeXnicCenter** — (http://texniccenter.sourceforge.net/front_content.php) IDE for windows
- ▶ **AucTex** — (<http://www.gnu.org/software/auctex/>) mode for latex authoring in emacs (from Marius)
- ▶ **TeXShop** — (<http://www.uoregon.edu/~koch/texshop/>) IDE for latex on Mac (from Krzysztof et. al)
- ▶ **Kile** — (<http://kile.sourceforge.net/>) IDE for linux
- ▶ **JabRef** — (<http://jabref.sourceforge.net/>) for managing your bibliographies (from Julie)
- ▶ Many others out there ... consult your local tex guru