

A Brief Introduction to \LaTeX

Rebecca Ingram

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1 What is \LaTeX ?

Many of you are probably familiar with creating and editing documents using applications like Microsoft Word or Open Office Writer. These types of editors are classified as WYSIWYG, that is, “what you see is what you get.” In contrast, \LaTeX is a markup language which allows you to use commands to specify exactly how you want your document to look. So where WYSIWYG editors have you point and click on the formatting features you want, \LaTeX has you to describe them using its syntax.

2 Why use \LaTeX ?

Admittedly, there is a bit of a learning curve involved in using \LaTeX , so why should you bother taking the time to learn it? One feature of \LaTeX that makes it useful for Computer Science and other science disciplines is that inserting mathematical equations is very easy and looks good. As an example, here’s a simple equation:

$$1 + 2 + \dots + n = \frac{n(n+1)}{2}$$

Creating bibliographies is also much nicer in \LaTeX because your entries will automatically be alphabetized and numbered for you. You can also give each reference a label so that when you cite it in your document \LaTeX will take care of inserting the correct reference number for you.

Another useful feature is the ability to create and use packages that extend the capabilities of the language. For example, there are graphics packages for inserting image files or providing instructions to draw your own images; there are several math packages, which you will likely include for proofs; and there are even MLA and APA style packages in case you want to write other papers with \LaTeX . Although \LaTeX has many more great features, I won’t go into those here.

3 Installing L^AT_EX

As I mentioned earlier, L^AT_EX is actually a language, which means that you will need a compiler to use it. You will create your documents using a text editor, then compile them into pdf files. The computers in the Burrow already have the compiler installed, so you can use them if you just want to experiment a little bit.

If you are using Linux, the necessary files will almost certainly be available in your package manager. After you have installed them, you should be ready to go. You may either try to find a front-end or type your documents into a simple text editor (such as vim or emacs) and compile your documents in a terminal. If you are using a terminal, compile your document with the following command (where “file” is the name of your tex file):

```
$ pdflatex file.tex
```

If for any reason `pdflatex` does not work, try using the `latex` command instead. If you have used any labels in your document, you may have to run `latex` twice. Also, the `latex` command produces a dvi file, so you will also have to run `dvipdf` to create a pdf file. To summarize, if `pdflatex` does not work, do the following to compile your document:

```
$ latex file.tex
$ latex file.tex
$ dvipdf file
```

Note that `dvipdf` will not work if you include the `.tex` extension.

If you are using Windows, you will probably want to download WinEDT to start. It is shareware, so you will not have to pay for it. There is a button you can click to compile your documents in the program.

If you are using a Mac, you should use TeXShop, which is also available for free download. It also has a button to compile your documents in the program.

For those who are using Windows or Mac OS X, please be aware that I have never set up L^AT_EX to work on either system. Feel free to ask me questions if you are having trouble setting it up on either of these operating systems, but be forewarned that I may not be able to help you much.

4 A Simple L^AT_EX Document

To create a very simple document, open your editor of choice and type in the following:

```
\documentclass{article}
\begin{document}
My first document!
\end{document}
```

Compile your document and then preview the pdf document. It should contain the words “My first document!” and nothing else. Every L^AT_EX document you create will need to have the documentclass, and begin and end document lines. Although there are different document classes besides article, I will not discuss any of them here.

This simple document is okay, but it doesn’t have your name or a title on it, which you will likely want on papers you intend to turn in. So let’s add them. We’ll go ahead and add a list, too, while we’re at it.

```
\documentclass{article}
\title{Homework Assignment 1}
\author{Your Name}
\date{September 7, 2009}

\begin{document}
\maketitle
\begin{enumerate}
\item Answer homework problem 1 here.
\item  $1 + 2 + \dots + n = \frac{n(n+1)}{2}$ 
\end{enumerate}
\end{document}
```

You should see a nice big title with your name and the date on the two lines below it. Below that, you should have a numbered list with the text “Answer to homework problem 1 here.” next to the number one, and a math equation next to the number two. The dollar signs indicate that you are using the math mode, which specially formats your text. To insert an actual dollar sign (or curly brackets) into your document, you will have to prefix it with a backslash: $\$$.

Here is a link to a very helpful cheat sheet with some of the most common commands: <http://stdout.org/~winston/latex/>. You will not understand everything on it at this point, and most of it will not be relevant to creating your homework documents. The most helpful for you will be the math mode and math mode symbols sections, which explain some of the most common math symbols. You may also want to glance at the syntax for creating a table, which is in the far right column of the second page. I will put up a more intricate sample document for you later this week.