An Overview of LaTeX

April 1, 2014

LaTeX is a typesetting language developed by Lesley Lamport in the 1980's.[1] It allows mathematicians to typeset documents that contain complicated equations and symbols with relative ease. Here are some "quick facts" about using LaTeX.

1 Quick Facts

- A LaTeX file is simply a text file. You can create it with Notepad on a PC or any other simple text editor.
- Once a `.tex` file is created, it is "compiled" using a TeX engine. The result is a `.pdf` file.
- Most people prefer to use a *frontend* program such as `WinEdt` or `TeXShop`. These programs contain features that make editing LaTeX files easier.
- The simplest LaTeX file starts with three commands: \documentclass{*style*}, \begin{document}, and \end{document}.
- Between the \begin{document} and \end{document} commands, you can put the commands/text that make up your document.
- LaTeX allows you to number equations automatically, easily compile a bibliography, insert figures, typeset complicated equations, etc.
- A great resource for getting started with LaTeX is `https://www.tug.org/begin.html`.

2 Basic Syntax

Here is some basic syntax for getting started in LaTeX:

[1] Donald Knuth created the backend program TeX in the 1970's.

- LaTeX does not recognize white space in your text document. That is, one space will be treated as a space, but multiple spaces and/or a line feed will also be treated as one space.
- Any line that starts with % is considered a *comment* and will be ignored when the document is compiled. Comments are good for organizing long documents or making notes to yourself about material you have created.
- All commands for special characters, typesetting tools, etc., start with \. For example, to create some italicized text, the text is "wrapped" in the command `\textit{ }`.
- Commands are **case sensitive!** LaTeX will crash if you issue the command `\Textit{ Hello World! }`.
- LaTeX has a math mode. That is, when you typeset mathematics, you must begin and end that part of your document with $ signs. For example `$\alpha$` creates α but `\alpha` will create an error.
- There are reserved characters in LaTeX: # $ % ^ & _ { } ~ \. You cannot use these characters without putting a \in front of them.

3 Debugging

Debugging is sometimes very difficult with LaTeX.

- Most errors occur when the commands are not typed in a case-sensitive manner.
- Other common errors occur when a left or right brace/parenthesis/bracket is missing.
- Another common error is when the beginning of an environment does not match the end of an environment. For example, the environment `\begin{equation*}` coupled with `\end{equation}` will produce an error.
- When you get an error, a dialog box will open in WinEdt or TeXShop. Usually the error message is not helpful for fixing the error. The easiest way to exit this dialog box is to type an "x" at the prompt and then try to figure out the error.