\LaTeX\ Installation and Introduction

Andrew McAllister

Society of Physics Students

September 21st, 2011
What is \texttt{LaTeX}?

LaTeX is a typesetting system that is considered the “standard” for writing scientific papers - especially those with a lot of math.
What is \LaTeX?

\LaTeX is a typesetting system that is considered the “standard” for writing scientific papers - especially those with a lot of math.

Consider the following example:

\[ \int_a^b f(x) \, dx = \lim_{n \to \infty} \sum_{i=1}^n f(c_i) \Delta x_i \]

OR:

\[ \int_a^b f(x) \, dx = \lim_{n \to \infty} \sum_{n=1}^n f(c_i) \Delta x_i \]
What You Need to Run \LaTeX

- A \LaTeX Distribution
- An Editor
- A Document Viewer
The most common distribution is Miktex which can be found at miktex.org.
The most common distribution is Miktex which can be found at miktex.org.

Miktex also easily installs packages for you.

Examples:
- AMS Math Packages
- Resume Packages
- TikZ and PGF...
...Which does things like this:
We’ve got a lot of choices here, why use TeXnic Center?

- Easy to install
- Lots of features to help new users
This is the easy one you all already have Acrobat installed on your computers.
Actually Writing a \LaTeX Document!

The Basic Structure
Actually Writing a $\LaTeX$ Document!

The Basic Structure

\documentclass[11pt]{article}
\usepackage{amssymb}
\usepackage{amsmath}
\usepackage{amsfonts}
\usepackage{enumerate}

\begin{document}
\end{document}
\begin{document}
\title{Your Title}
\author{You}
\date{The Date}
\maketitle
\tableofcontents
\section{Stuff}
To write regular text, just write wherever you want it to appear.
\subsection{More Stuff}
\subsubsection{Even More Stuff}
\end{document}
Your Title

You

The Date

Contents

1 Stuff

1.1 More Stuff

1.1.1 Even More Stuff

1 Stuff

To write regular text, just write wherever you want it to appear.

1.1 More Stuff

1.1.1 Even More Stuff
Including Math (the important thing)

There are two things that you need to know:

- Commands are always started with a backslash.
- “Math Mode” - Inline math mode is surrounded by: \( ( \text{MATH} ) \)
- Separate line math mode is surrounded by: \[ \text{MATH} \]
Including Math (the important thing)

There are two things that you need to know:

- Commands are always started with a backslash
- “Math Mode” - Inline math mode is surrounded by: \( ( \text{MATH} \) \\
Separate line math mode is surrounded by: \[ \text{MATH} \]

NOTE: Some people use $ to and $$ for math mode. I think this is weird looking and prefer to use paranthesis and brackets, but you can use either.
Some Basic Math Commands

Greek Letters: Just use \[ \text{LETTER} \]
\[ \text{\lambda} = \lambda \]
\[ \text{Lambda} = \Lambda \]

Del is called nabla:
\[ \nabla = \nabla \]

Integrals and Sums:
\[ \int \text{and} \sum \]

Upper and Lower "Things": Upper - \[ \hat{\text{Upper}} \] Lower - \[ \text{Lower} \]

Trig Functions:
\[ \sin, \cos \text{ etc.} \]

Fractions:
\[ \text{frac}\{\}{} \]
Some Basic Math Commands

- Greek Letters: Just use `\LETTER`
  \[ \text{\textbackslash lambda} = \lambda \]
  \[ \text{\textbackslash Lambda} = \Lambda \]
Some Basic Math Commands

- Greek Letters: Just use \LETTER
  \lambda = \lambda \ \Lambda = \Lambda
- Del is called nabla: \nabla = \nabla
Some Basic Math Commands

- Greek Letters: Just use \LETTER
  \lambda = \lambda \quad \Lambda = \Lambda
- Del is called nabla: \nabla = \nabla
- Integrals and Sums: \int and \sum
Some Basic Math Commands

- Greek Letters: Just use `\LETTER`
  \[\text{\textbackslash lambda} = \lambda \text{ \textbackslash Lambda} = \Lambda\]
- Del is called nabla: `\nabla`
- Integrals and Sums: `\int` and `\sum`
- Upper and Lower “Things”: Upper - \(\hat{\text{Lower}}\) - \(\_\)
Some Basic Math Commands

- Greek Letters: Just use \LETTER
  \lambda = \lambda \quad \text{and} \quad \Lambda = \Lambda
- Del is called nabla: \nabla = \nabla
- Integrals and Sums: \int and \sum
- Upper and Lower “Things”: Upper - \hat{\text{Lower}} - \\n- Trig Functions: \sin, \cos etc.
Some Basic Math Commands

- Greek Letters: Just use \LETTER
  \lambda \equiv \lambda \quad \Lambda \equiv \Lambda
- Del is called nabla: \nabla \equiv \nabla
- Integrals and Sums: \int \text{ and } \sum
- Upper and Lower “Things”: Upper - \hat{\text{Lower}} - _\_
- Trig Functions: \sin, \cos etc.
- Fractions: \frac{\{}\{}
Text Sizes

1 \tiny
2 \scriptsize
3 \footnotesize
4 \small
5 \normalsize
6 \large
7 \Large
8 \LARGE
9 \huge
10 \HUGE
**Basic Formatting - 2**

**Font Emphasis**
- Bold - `\textbf{}`
- Italic - `\emph{}`

**Breaks**
- Line Break `\newline`
- Page Break `\newpage`
Making Lists These are contained in environments -

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

Instead of itemize you can have enumerate or description.
Tables are contained in the Table Environment:

\begin{table}[H]
\begin{center}
\begin{tabular}{| c | c | c |}
\hline & \textbf{Outgoing Officers (2010-2011)} & \textbf{Incoming Officers (2011-2012)} \\
\hline
\textbf{President} & Andrew McAllister & Charles Martin \\
\hline
\textbf{Vice President} & Joe Paki & Krysta Boccuzzi \\
\hline
\textbf{Secretary/Treasurer} & Charles Martin & Amy Lovell \\
\hline
\textbf{Outreach Coordinator} & Allycia Gariepy & Ryan Roussel \\
\hline
\end{tabular}
\end{center}
\end{table}
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
<td>Andrew McAllister</td>
<td>Charles Martin</td>
</tr>
<tr>
<td>Vice President</td>
<td>Joe Paki</td>
<td>Krysta Boccuzzi</td>
</tr>
<tr>
<td>Secretary/Treasurer</td>
<td>Charles Martin</td>
<td>Amy Lovell</td>
</tr>
<tr>
<td>Outreach Coordinator</td>
<td>Allycia Gariepy</td>
<td>Ryan Roussel</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>President</strong></td>
<td>Andrew McAllister</td>
<td>Charles Martin</td>
</tr>
<tr>
<td><strong>Vice President</strong></td>
<td>Joe Paki</td>
<td>Krysta Boccuzzi</td>
</tr>
<tr>
<td><strong>Secretary/Treasurer</strong></td>
<td>Charles Martin</td>
<td>Amy Lovell</td>
</tr>
<tr>
<td><strong>Outreach Coordinator</strong></td>
<td>Allycia Gariepy</td>
<td>Ryan Roussel</td>
</tr>
</tbody>
</table>
Figures

Inserting figures into documents is easy:

\begin{figure}[H]
\includegraphics[scale = .5]{FILENAME}
\end{figure}
Figures

Inserting figures into documents is easy:

\begin{figure}[H]
\includegraphics[\textwidth]{FILENAME}
\end{figure}

Getting them where you want is NOT.
Inserting figures into documents is easy:

\begin{figure}[H]
\includegraphics[scale = .5]{FILENAME}
\end{figure}

Getting them where you want is NOT.
The best advice I can give is to use [h!] or [H] after your begin figure or table. This is telling Latex to put the figure HERE in the document.
Common Warning/Error Messages

Overfull or Underfull Boxes - Not that big of a deal.

“I can’t write on file…” - You have the pdf open, it can’t be made unless you close it.

File ended while scanning the use of... - You didn’t close a curly bracket or forgot to end an environment.
Some Packages/Other Interesting Things

amssymb
amsmath
amsfonts
Graphicx
BibTex
Beamer
What Next?

I have a few books on starting latex that I can give to you/put online. I also can give some example documents to look at.

If there is interest I can do some more advanced subjects.

Don’t forget - lots of upperclassmen use LaTeX and can help. Also, the internet has the answer to 99% of your questions about Latex.