Introduction to LaTeX
A Quick Crash Course

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What is LaTeX?

- A document typesetting markup language
- A tool that can save you a lot of time
- Commonly used to write research papers, but useful for many other things too (resumes, calendars, posters, books, letters, notes, this slideshow...)

Setup

- Windows: MiKTeX
- Mac: MacTeX
- Linux: `apt-get install texlive`
- Online:
  - Overleaf
  - ShareLatex

Using Overleaf

Go to overleaf.com and click "Create a New Paper".
Then click "Source"

This is a screenshot of the Overleaf editor interface showing LaTeX source code.

Top navigation bar: Overleaf | PROJECT | VERSIONS | SHARE | PDF | PUBLISH

Toolbar: Source | Rich Text | Edit | Find | § | s | B | I | π | Π

Tooltip: "Rich Text is in beta. Feedback appreciated!"

Right panel: Preview | Manual | Auto

```latex
                    r]{article}

\usepackage[english]{babel}
\usepackage[utf8x]{inputenc}
\usepackage{amsmath}
\usepackage{graphicx}
\usepackage[colorinlistoftodos]{todonotes}

\title{Your Paper}
\author{You}

\begin{document}
\maketitle

\begin{abstract}
Your abstract.
\end{abstract}

\section{Introduction}

Your introduction goes here! Some examples of commonly used commands and features are listed below,
to help you get started. If you have a question, please use the help menu (``?'') on the top bar to
search for help or ask us a question.

\section{Some examples to get started}

\subsection{How to add Comments}

Comments can be added to your project by clicking on the comment icon in the toolbar above. % *
<john.hammersley@gmail.com> 2014-09-03T09:54:16.211Z:
%
% Here's an example comment!
%
To reply to a comment, simply click the reply button in the lower right corner of the comment, and
you can close them when you're done.
```

Preview pane (rendered PDF):

Your Paper

You

April 12, 2016

Abstract

Your abstract.

1   Introduction

Your introduction goes here! Some examples of commonly used commands and features are listed below, to help you get started. If you have a question, please use the help menu ("?") on the top bar to search for help or ask us a question.

2   Some examples to get started

2.1   How to add Comments

Comments can be added to your project by clicking on the comment icon in the toolbar above. To reply to a comment, simply click the reply button in the lower right corner of the comment, and you can close them when you're done.

2.2   How to include Figures

First you have to upload the image file from your computer using the link on the project menu. Then use the includegraphics command to include it in your document. Use the figure environment and the figure command to add a number and a caption to your figure. See the code for Figure 1 in this document for an example.

Figure 1: This frog was uploaded via the project menu.

A LaTeX document has two main parts (called environments):

- Preamble Environment
    - Set up the rules for how your document will look
- Document Environment
    - The place where you write your document

The Code for `helloworld.tex`
Making our first LaTeX document

```latex
% this is our preamble
\documentclass[11pt]{article}

% this is our document environment
\begin{document}
    Hello, world!
\end{document}
```

Let's add a Title!
Making our first LaTeX document

```
\documentclass[11pt]{article}

% title information goes here:
\title{Hello, World!}
\author{your name goes here}
\date{\today}

\begin{document}
    % title gets made here:
    \maketitle

    Hello, world!
\end{document}
```

Adding Graphics from Mathematica

First add the `graphicx` package in your documents preamble:

```
\usepackage{graphicx}
```

Then add the following code to your document's body:

```
% include a picture shrunk to half its size
\includegraphics[scale=0.5]{mathematicapic}
```

Adding a table
Making our first LaTeX document

```
\begin{center} % center the table

    % tabular environment makes tables
    % {|l|l||r|} makes three columns with borders
    % adjacent cells are separated by '&'
    % '\hline' makes a horizontal line
    % '\\' ends a row
    \begin{tabular}{|l|l||r|}
        \hline
        a1 & b1 & c1 \\
        a2 & b2 & c2 \\
        a3 & b3 & c3 \\
        \hline
        a4 & b4 & c4 \\
        \hline
    \end{tabular}
```

The Math Environment

- LaTeX was originally designed to make it easy to write nice looking mathematical notation.
- If you want to write math, use the `amsmath` package.
- Since math formulas need to look different than normal text, they go in their own special math environment.

Adding Math
Making our first LaTeX document

First add the `amsmath` package in your document's preamble:

```
\usepackage{amsmath}
```

Then add the following code to your document's body:

```
\section{Inline Math}
% Here we use \( and \) to write math
    inline with normal text.
One of the trigonometric sum identities is
\( \sin (x) + \sin (y) = 2 \sin (\frac{x+y
    }{2}) \cos (\frac{x-y}{2}) \).

\section{Separate Math}
% Here we use \[ and \] to write math
    separate from normal text.
\[ \forall x \in X, \quad \exists y \leq \
    epsilon \]

\subsection{Product Rule}
% Here we use both techniques
If \(f\) and \(g\) are differentiable at
    \(x\), then

\[ \frac{d}{dx}(f(x)g(x)) = f'(x)g(x) + f(
    x)g'(x) \]
```

A More Advanced Example

Start a new project and load `basic-example.tex` from the examples folder

Look at the code. There are some things we've already covered, and some other things we haven't.

Resources

Learning LaTeXtakes time. These resources will help:

- Templates!
- More Templates!
- Even More Templates!
- LaTeX Wikibook
- A quick introduction
- Mini Tutorial
- Question and Answer Community

Google is your friend: How do I make an integral symbol in latex?