A Very Quick Introduction To LaTeX

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March 15th, 2018

Outline

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2. How Do I Use LaTeX?

3. Typesetting Mathematics In LaTeX

4. Learning LaTeX

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- LaTeX makes many decisions automatically in order to easily produce high quality output that doesn't require the reader to own proprietary software.
- LaTeX was designed to make typesetting mathematical formulae easy.

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LaTeX is free software and can be easily installed on your own computers. The department recommends Windows users install MiKTeX (miktex.org) and macOS/OS X users install MacTeX (http://www.tug.org/mactex/). These come with specialised LaTeX frontends (editors).

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There exist iPad apps capable of producing LaTeX documents, and you can also produce LaTeX documents using a web browser with ShareLaTeX (and others).

What Does A LaTeX File Look Like?

Let's now look at the most basic example of a LaTeX file:

```
\documentclass{article}
\begin{document}
Some text here
\end{document}
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Although this produces a document, it has very minimal formatting and isn't very attractive. Let's consider an example with some more structure.

```
\documentclass{article}
% We define an Author, Title and Date
\author{Sam Fearn}
\title{A Very Quick Introduction To \LaTeX{}}
\date{March 15\textsuperscript{th}, 2018}

\begin{document}
% Create a title from our Author, Title and Date
\maketitle
\section{Introduction}
Some introductory text goes here
\section{Content}
The main content goes here
\end{document}
```

With very little effort we have a nicely formatted document.

Typesetting Mathematics In LaTeX

LaTeX is very good at typesetting mathematical formulae:

```
If $\phi(x) = \frac{1}{\sqrt{2\pi}}e^{- x^2/2}$, then
\begin{equation}
        \Phi(x) := \int_{-\infty}^x \phi(t) dt.
\end{equation}
Moreover,
\begin{equation}
        \int_{-\infty}^\infty \frac{1}{\sigma
\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}
\right)^2} dt = 1
\end{equation}
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$$\int_{-\infty}^{\infty} \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} dt = 1. \tag{1}$$

Another example:

```
We say a map $\psi:A \to B$ is \emph{injective} if
\begin{equation}
        \psi(a_1) = \psi(a_2) \implies a_1 = a_2,\
\forall\ a_1,a_2 \in A.
\end{equation}
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$$\psi(a_1) = \psi(a_2) \implies a_1 = a_2, \ \forall \ a_1, a_2 \in A. \tag{2}$$

Learning LaTeX

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Some useful resources to be aware of are:

- The department's page on LaTeX for undergraduates. This contains links to the relevant installers, as well as instructions for running LaTeX on university computers.

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You don't have to learn everything about LaTeX initially, just start trying to write in LaTeX and you'll figure it out as you go!

Questions?

Activities:

- Try to reproduce the worksheet as closely as possible.
- Type up some of your discrete report in LaTeX.
- Explore and modify the tex file for this talk.