

# Introduction to L<sup>A</sup>T<sub>E</sub>X & Overleaf

Ricky Patterson

UVa Library

27 Sep 2018

(View source: <https://www.overleaf.com/read/vshrryxvbhfw>)

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Intro to L<sup>A</sup>T<sub>E</sub>X & Overleaf

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## Introduction

- ▶ L<sup>A</sup>T<sub>E</sub>X is a document preparation system for high quality typesetting
- ▶ Not a Word Processor - Allows authors to focus on content rather than appearance.
- ▶ Frequently used in the preparation of scientific or technical documents, but can be used to create letters, dissertations, music scores, calendars, presentations, etc., etc., etc.

## L<sup>A</sup>T<sub>E</sub>X Features

- ▶ Typesetting articles, reports, books, presentations
- ▶ Typesetting complex formulas
- ▶ Control sectioning, cross-references, tables and figures
- ▶ Automatic generation of bibliographies, indexes, and TOCs
- ▶ Free, and Multi-platform (Win/Mac/Linux)
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However...

- ▶ Steep learning curve
- ▶ Not WYSIWYG
- ▶ Can't easily convert to and from Word, etc.

## Basic Document

```
\documentclass{article}

\title{My First \LaTeX{}Document}

\author{Ricky Patterson}

\institute{UVa Library}

\date{September 2018}

\begin{document}

\maketitle

Hello world!

\end{document}
```

# My First L<sup>A</sup>T<sub>E</sub>X Document

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- ▶ At minimum, it must contain a `\documentclass[options]{document_type}` statement...

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  - ▶ `report`: also contains chapters
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  - ▶ `letter`: for writing letters
- ▶ Options
  - ▶ Font Size (`10pt`, `11pt`, `12pt`)
  - ▶ Paper Size (`letterpaper`), and Orientation (`landscape`)
  - ▶ Page Format (`twocolumn`, `oneside`)
  - ▶ and others...



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- ▶ You can write your own packages (or more likely edit/tweak an existing package to alter the behavior in order to meet your needs). They are simply lines of L<sup>A</sup>T<sub>E</sub>X commands.

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`\end{document}`
- ▶ But it will produce a blank page

## Document

- ▶ Hello World document:

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- ▶ Double quotes are produced by typing two of the opening quote (‘) or closing quote (’)

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- ▶ `text$_{sub}$` yields text<sub>sub</sub> while `text$^{\sup}$` yields text<sup>sup</sup>. Note that any text in math mode will by default have an italic face. Use `\rm` to get a normal (roman) font face. `text$_{\rm sub}$` yields text<sub>sub</sub>

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- ▶ The overall font size is set in preamble, but you can change font size temporarily: `{\tiny tiny text}` gives tiny text. Other sizes: `scriptsize`, `footnotesize`, `small`, `normalsize`, `large`,

Large LARGE huge and Huge

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- ▶ `\begin{description}` also produces a list with each `\item[Point I] text` yields:  
**Point I** text

## Tables and Figures

- ▶ Use `tabular` for basic tables — see Table 1, for example.
- ▶ To include a figure in your document, use the `includegraphics` command (see the comment below in the source code).

Item	Quantity
Widgets	42
Gadgets	13

Table 1: An example table.

## Readable Mathematics

Let  $X_1, X_2, \dots, X_n$  be a sequence of independent and identically distributed random variables with  $E[X_i] = \mu$  and  $\text{Var}[X_i] = \sigma^2 < \infty$ , and let

$$S_n = \frac{X_1 + X_2 + \dots + X_n}{n} = \frac{1}{n} \sum_{i=1}^n X_i$$

denote their mean. Then as  $n$  approaches infinity, the random variables  $\sqrt{n}(S_n - \mu)$  converge in distribution to a normal  $\mathcal{N}(0, \sigma^2)$ .



## Installing and Using

- ▶ There are several browser/cloud-based solutions. Overleaf, ShareLaTeX and Authorea all provide **collaborative** editing capabilities and L<sup>A</sup>T<sub>E</sub>X package and template support. There are free and paid versions of each. The UVa Library has purchased a site license for the paid version of Overleaf, available to everyone at UVa.
- ▶ You can also install L<sup>A</sup>T<sub>E</sub>X locally. [TeXLive \(MacTeX on Macs\)](#) is one good (and free) choice. It can be configured to check for package updates at CTAN automatically.
- ▶ When you try to write valid L<sup>A</sup>T<sub>E</sub>X you'll want an editor that has a L<sup>A</sup>T<sub>E</sub>X mode. TeXShop (part of TeXLive) is one, TeXStudio is another. Emacs and VIM have good support.

## References/Resources

- ▶ CTAN (Comprehensive T<sub>E</sub>X Archive Network): [ctan.org](http://ctan.org)
- ▶ TUG (T<sub>E</sub>X Users Group): [tug.org](http://tug.org)
- ▶ T<sub>E</sub>X Stack Exchange: [tex.stackexchange.com](http://tex.stackexchange.com)
- ▶ The L<sup>A</sup>T<sub>E</sub>X Companion (Mittelbach & Goossens, 2004) [ebook](#)
- ▶ A Guide to L<sup>A</sup>T<sub>E</sub>X (Kopka and Daly, 1999) [book](#)
- ▶ The Not So Short Intro to L<sup>A</sup>T<sub>E</sub>X (Oetiker, updated Feb 2018) → [lshort.pdf](#)
- ▶ This presentation: [overleaf.com/read/vshrryxvbjwh](http://overleaf.com/read/vshrryxvbjwh)
- ▶ Materials from our previous L<sup>A</sup>T<sub>E</sub>X workshops: [data.library.virginia.edu/training/past-workshops/](http://data.library.virginia.edu/training/past-workshops/)
- ▶ [overleaf.com/edu/virginia](http://overleaf.com/edu/virginia) Templates and Guides
- ▶ [overleaf.com/learn/latex/Learn\\_LaTeX\\_in\\_30\\_minutes](http://overleaf.com/learn/latex/Learn_LaTeX_in_30_minutes)