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www.overleaf.com

and make an account

...

or open your favourite LaTeX editor

# LaTeX

## A Short Introduction

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University of Toronto
Libraries

2023 Aug 16

# Overview

# What is LaTeX?

A typesetting program: *content* → *a document*

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A typesetting program: *content* $\rightarrow$ *a document*

input: `filename.tex` LaTeX output: `filename.pdf`

```
\documentclass{article}
\usepackage{amsmath}
\title{\LaTeX}
\author{Wikipedia}
\date{January 1, 2020}

\begin{document}
  \maketitle
  \LaTeX{} is a document preparation system for the \TeX{} typesetting
  program. It offers programmable desktop publishing features and
  extensive facilities for automating most aspects of typesetting and
  desktop publishing, including numbering and  cross-referencing, tables
  and figures, page layout, bibliographies, and much more. \LaTeX{} was
  originally written in 1984 by Leslie Lamport and has become the
  dominant method for using \TeX; few people write in plain \TeX{}
  anymore. The current version is \LaTeXe.

  % This is a comment, not shown in final output.
  % The following shows typesetting  power of LaTeX:
  \begin{align}
    E_0 &= mc^2 \\
    E &= \frac{mc^2}{\sqrt{1-\frac{v^2}{c^2}}}
  \end{align}
\end{document}
```

LaTeX

Wikipedia

January 1, 2020

LaTeX is a document preparation system for the TeX typesetting program. It offers programmable desktop publishing features and extensive facilities for automating most aspects of typesetting and desktop publishing, including numbering and cross-referencing, tables and figures, page layout, bibliographies, and much more. LaTeX was originally written in 1984 by Leslie Lamport and has become the dominant method for using TeX; few people write in plain TeX anymore. The current version is LaTeX $2_\varepsilon$.

$$E_0 = mc^2 \tag{1}$$

$$E = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}} \tag{2}$$

# Advantages of LaTeX

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- separate content and formatting
- automate numbering, cross-references, . . . everything! (except writing)
- beautiful math
- comments and version control
- no version compatibility issues
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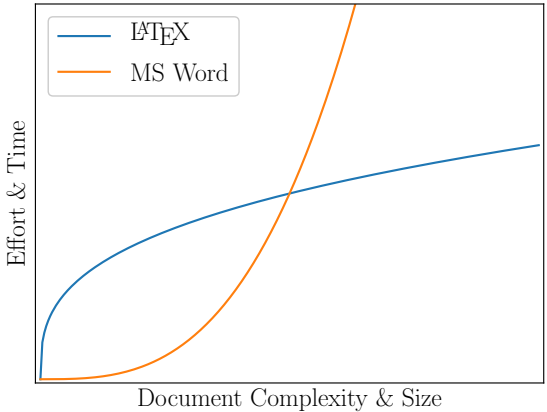
# LaTeX vs MS Word



# How does LaTeX Work?

Three layers:

1. "kernel" – parses code, stores things, creates PDF
   + "built-ins" – functions, e.g. `\newcommand{\pi}{3.14}`; then `\pi` becomes "3.14"
2. "classes" – types of document, e.g. an article, having: format, title, etc.
   + "packages" – modify or extend a class, e.g. add graphics
3. "document" – this specific document, e.g. your thesis

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Boxes:

→ characters

→ words

→ lines

→ paragraphs

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- **modes:** horizontal, vertical, math
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- **penalties:** avoid "bad" layouts

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- no install + package management
- must have internet connection
- pay to integrate reference database
- some collaborate features

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Overleaf

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- pay to integrate reference database
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TEX studio

- install + manage packages locally
- no internet connection required
- free to integrate reference database
- DIY collaborate

# Your First Document

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\documentclass{article}
% document header
\begin{document}
  % document content
  Hello World
\end{document}
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Go to: Overleaf.com

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- sections, subsections, etc.
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# Helpful Resources

- Overleaf – online LaTeX writing application
- LaTeX Install Guide – to install LaTeX on your computer (offline)
- TeXstudio – great editor for composing LaTeX "code" (offline)
- TeX Stack Exchange – Q & A style how-to and debugging help
- Github Repository – example documents & "cheat sheets"