Please go to
www.overleaf.com
and make an account

. . .

or open your favourite LATEX editor

LaTeX

A Short Introduction

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Libraries

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Overview

Introduction

How LaTeX Works

Getting Started

Resources

What is LaTeX?

A typesetting program: *content → a document*

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What is LATEX?

A typesetting program: *content → a document*

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

```
1  \documentclass{article}
2  \usepackage{amsmath}
3  \title{\LaTeX}
4  \author{Wikipedia}
5  \date{January 1, 2020}
6
7  \begin{document}
8    \maketitle
9    \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.
10
11   % This is a comment, not shown in final output.
12   % The following shows typesetting power of LaTeX:
13   \begin{align}
14     E_0 &= mc^2 \\
15     E &= \frac{mc^2}{\sqrt{1-\frac{v^2}{c^2}}}
16   \end{align}
17 \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_ε.

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

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

Advantages of LATEX

Advantages of LaTeX

- ▶ separate content and formatting
- ▶ automate numbering, cross-references, ...everything! (except writing)
- ▶ beautiful math
- ▶ comments and version control
- ▶ no version compatibility issues
- ▶ it's free and open source!

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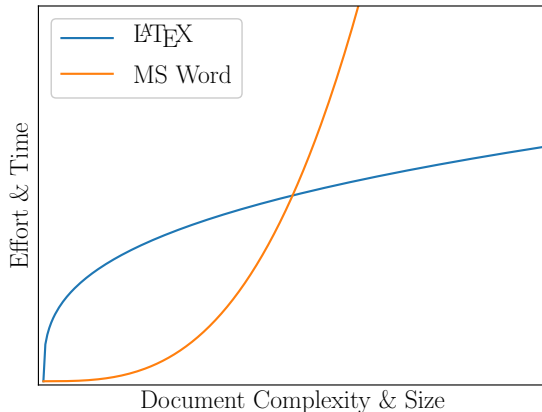- ▶ no version compatibility issues
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LaTeX vs MS Word

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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Kernel: Putting Stuff on a Page

Boxes:
  → characters
    → words
      → lines
        → paragraphs
          → pages

it's a frog

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Combining boxes:

▶ **modes:** horizontal, vertical, math

▶ **glue:** stretchy space

▶ **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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- ▶ pay to integrate reference database
- ▶ some collaborate features

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

Your First Document

```
\documentclass{ut-thesis}
% document header
\begin{document}
  % document content
  Hello World
\end{document}
```

Go to: Overleaf.com

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\begin{document}
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- ▶ title, author, year, degree, department

- ▶ chapters, sections, etc.

- ▶ math

- ▶ floats: figures & tables

- ▶ cross-references & table of contents

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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

▶ LATEX Cheat Sheet   – a really nice reference for common commands

▶ Github Repository   – example documents: article, thesis, CV, poster, slides