LaTeX Introduction

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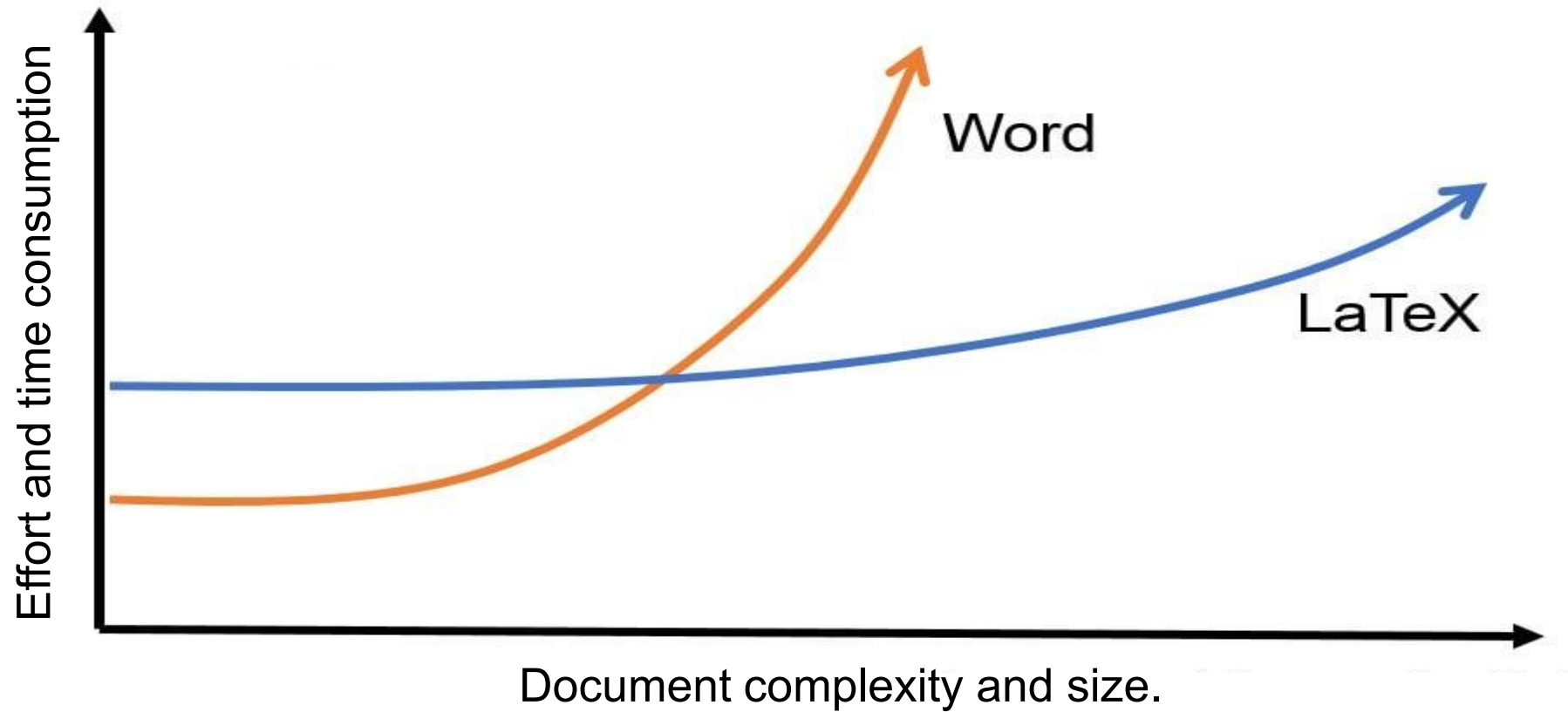
What is LaTeX?

➢ LaTeX is pronounced "lay-tech" or "lah-tech" , not "la-teks".

➢ LaTeX is a document preparation system for high-quality typesetting.

➢ LaTex is most often used to produce technical or scientific documents, but it can be used for almost any form of publishing.

➢ LaTeX automatically handles formatting like headings, numbering, and references.

➢ It is very good for writing equations, tables, and research papers.

Why Use LaTeX?

➢ Produces high-quality, professional documents

➢ Widely used for research papers, journals, and theses

➢ Excellent support for mathematical equations and symbols

➢ Automatically handles numbering, references, and citations

➢ Ensures consistent formatting throughout the document

➢ Saves time by separating content from formatting

➢ Preferred by IEEE, Springer, ACM, Elsevier journals

➢ Easy to manage large documents

LaTeX vs Ms Word

Effort and time consumption (y-axis) vs Document complexity and size (x-axis). Word increases sharply; LaTeX increases gradually.

Installing LaTeX

In Windows.

Step 1:

Download LaTeX Distribution

Go to [MiKTeX website](#)

Click **Download** for Windows.

Step 3:

Install a LaTeX Editor

You can use:

- **TeXworks** (comes with MiKTeX)
- **TeXstudio** (https://www.texstudio.org)
- **Overleaf** (online, no installation needed)

Step 2:

Install MiKTeX

- Run the downloaded installer
- Choose **"Install for anyone"** or **"Just for me"**
- Follow the instructions and finish installation

LaTeX commands

➢ \documentclass{..}

    Class type: article, report, book, letter.

    For presentation: beamer.

➢ \usepackages{…}

    Use to load additional functionality or features that are note available in the   basic LaTeX system.

    Rules: always before \begin{document} don't put them inside

                     \begin{document}. . . \end{document}.

➢ \title{…},\author{…},\date{…}

Document command,\begin{document} … \end{document}: main content area of your file where you

actually the text that appears in the output PDF.

LaTeX commands

➢ \maketitle is a LaTeX **command used to create and display the title section** of a

document.

It uses the information defined earlier by:

\title{...}

\author{...}

\date{...}

➢ \section{…} , \subsection{…}, \subsubsection{…}.

➢ New line in text in several ways : Leave a blank line : Creates a new paragraph. "\\",

Forces a new line without starting a new paragraph. Another "\newline", "\par".

LaTeX commands

➢ Comments:

For single line "%"

For multi line include \usepackage{comment}

\begin{comment}.. \end{comment}.

➢ Text Formatting:

- Bold: \textbf{…} example: This is \textbf{important} text.

- Italic: \textit{..} example This is \textit{important} text.

- Emp: \emph{This text is emphasized}

- Underline: \underline{This text is underlined}

LaTeX commands

➢ Text formatting:

Font Size:

\tiny

\scriptsize

\footnotesize

\small

\normalsize

\large

\Large

\LARGE

\huge

\Huge

\documentclass[10pt]{article}

\documentclass[11pt]{article}

\documentclass[12pt]{article}

Example:

{\small This is small text}

{\Large This is large text}

LaTeX commands

➢ Line Spacing:

\usepackage{setspace}

\singlespacing

\onehalfspacing

\doublespacing

Basic Vertical Spacing:

\vspace{length}

Length examples: 1cm, 0.5in, 10pt, 1em

LaTeX commands

➢ Font-family:

LaTeX groups fonts into families:

- **Serif (Roman)** – default, used in academic papers

- **Sans-serif** – clean, modern

- **Monospace (Typewriter)** – code and technical text

\textrm{This is serif text}

\textsf{This is sans-serif text}

\texttt{This is monospaced text}

For whole document

\renewcommand{\familydefault}{\rmdefault}

\renewcommand{\familydefault}{\ttdefault}

LaTeX commands

➢ **List:**   \usepackage{enumitem}

Unordered List (Bullet List)

\begin{itemize}

  \item First item

  \item Second item

  \item Third item

\end{itemize}

Ordered List (Numbered List)

\begin{enumerate}

  \item First item

  \item Second item

  \item Third item

\end{enumerate}

Customizing List –Next Lab

That's All for Today
Thank You