

Research Methodology & Technical Writing

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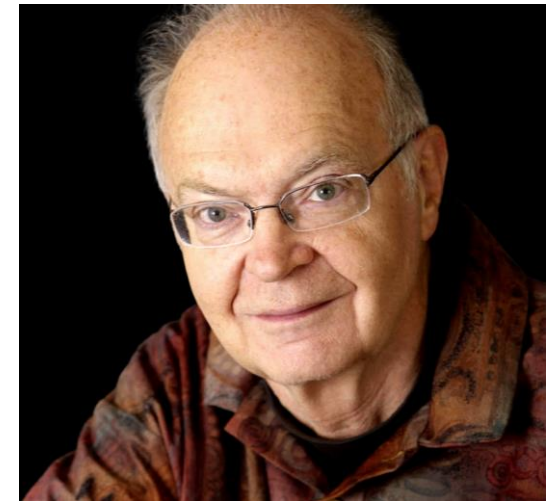
Fall, 2020



DOCUMENT PREPARATION SYSTEM



- TeX is essentially a **Markup Language** (like HTML, XML and RTF)
- TeX written by **Donald Knuth** in 70's.
 - A revolution in **typesetting** .
- **Latex** is an extension of TeX.
- **Macro packages** to make TeX easier to use.
- LaTeX is a **document preparation** system for high-quality typesetting.
- LaTeX pronounced “**lay-tech**” or “**lah-tech**”.
 - not like latex gloves!

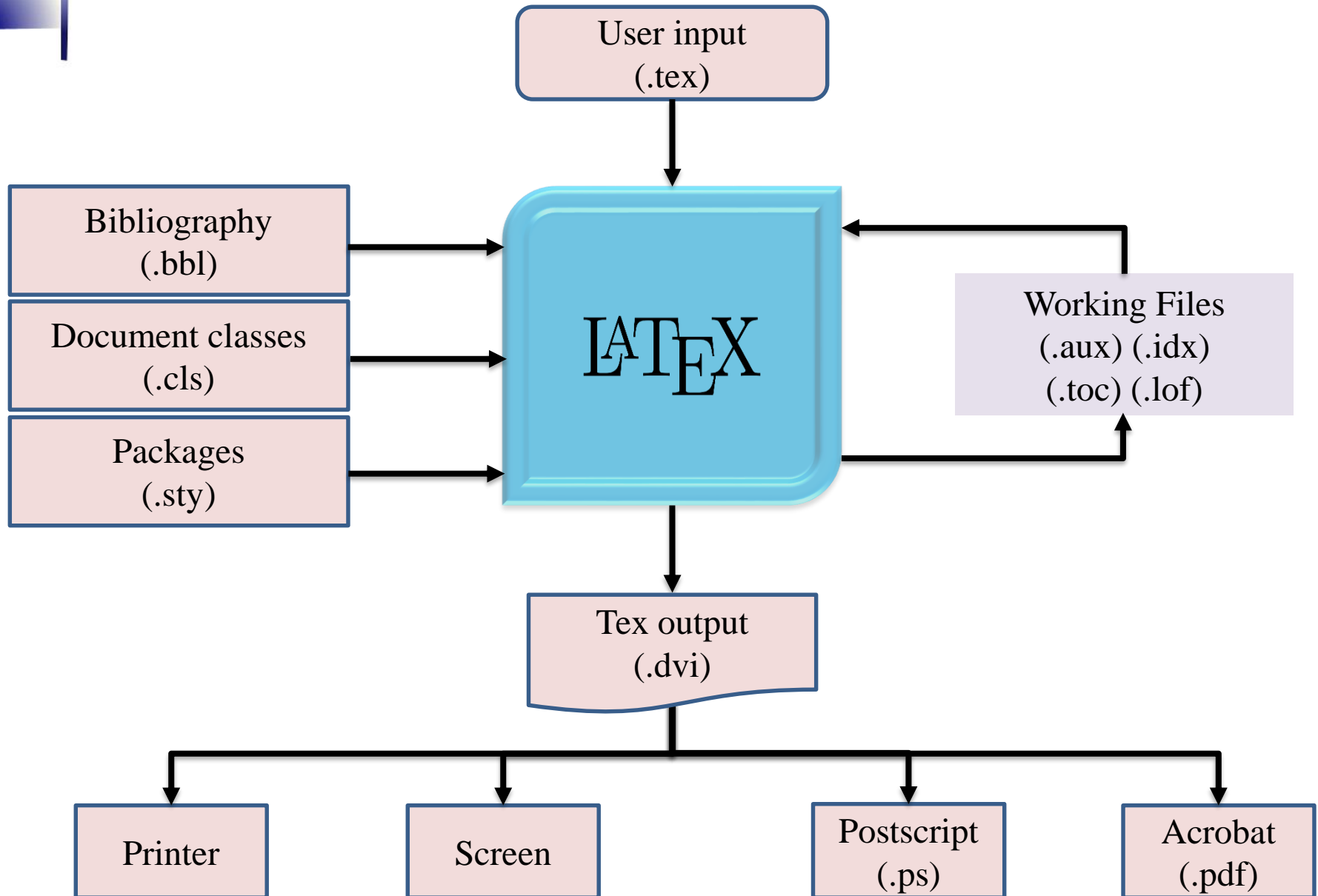


Advantages



- Designed by **academics** and easily accommodates academic use.
- Good for **large documents**
- De facto standard for **scientific publishing**
- Professional **typesetting**
- Best **output**
- It is the **standard** for scientific documents
- Processing **Mathematical** (& other) **symbols**
- **Meaning-based** structuring (rather than appearance)
- **Knowledgeable** and helpful user group
- Its **FREE!**
- **Platform independent**

The Mechanism



Compiler

- **MiKTeX**

- MiKTeX is a typesetting system for the Windows.
- Download from www.miktex.org for free
- It is generally recommended to install MiKTeX first, then WinEdt.



- **WinEdt**

- WinEdt is a text editor.
- WinEdt creates the source file (.tex and others).
- Download from www.winedt.com for free for 30 days.
- WinEdt costs \$30.



Editor

- **TexStudio**
 - An integrated **writing** environment
 - For creating **LaTeX** documents.
 - Easy and **comfortable**
 - **Syntax-highlighting**,
 - **Integrated** viewer,
 - **Reference** checking,
 - **Free**.



<https://www.texstudio.org/>

- **Document Class**

- Predefined Formats (article, report, book,...).

```
\documentclass{article}
```

```
\usepackage{package name}
```

- **Packages used**

- Added Functionality (graphics, reference style,...).

```
\title{Simple Example}
```

```
\date{January 2016}
```

- **Main Body**

- Text and Bibliography References.

```
\begin{document}
```

```
\maketitle
```

This is some sample text.

```
\end{document}
```


`\documentclass[options]{class}`

options = a4paper, 11pt, 12pt, 10pt, twocolumn, landscape,...

class = article, report, book,...

`\begin{equation}`

.....

`\end{equation}`

`\begin{figure}`

`\includegraphics{sample}`

`\caption{A sample figure.}`

`\end{figure}`

\tableofcontents % generates TOC

\listoftables % generates LOT

\listoffigures % generates LOF

\section{Section Title}

\subsection{Title}

\subsubsection{Title}

\appendix %change numbering schme

\chapter % for book and report document class

\enumerate % ordered lists with numbering

\itemize % non ordered lists with markers

Cross-referencing



\label{marker} **\ref{marker}** **\pageref{marker}**

\section{Introduction}

\label{intro}

...

As mentioned in section **\ref{intro}** in page **\pageref{intro}**

Typesetting Text

- `\\` or `\newline` and `\newpage`
- Bold `\textbf{.....}` or `\bf`
- Italics `\emph{.....}` or `\textit{.....}` or `\it`
- Underline `\underline{.....}` or `\ul`

Alignment

`\begin{flushright}`

Right aligned

`\end{flushright}`

Font size

`\tiny`

`\large`

`\scriptsize`

`\Large`

`\footnotesize`

`\LARGE`

`\small`

`\huge`

`\normalsize`

`\Huge`

Tabular

Columns

```
\begin{tabular} {|\dots|  
...\|}  
\end{tabular}
```

Rows

```
& % Split text into columns  
\\ % End a row  
\hline % Draw line under row
```

Figure

```
\begin{figure}[ht]  
\centering\epsfig{file=uni.ps, width=5cm}  
\caption{University of Helsinki}  
\label{uni}  
\end{figure}
```

Including Figures in main body

```
\epsfig{file=filename.eps, width=10cm, height=9cm,  
angle=90}
```

Citing references in text

`\cite{cuc98}` = (Cuce 1998)

`\citeN{cru98}` = Crud (1998)

`\shortcite{tom98}` = (Tom, et. al. 1998)

Manually

```
\begin{thebibliography}{}{ }
```

```
\bibitem[Come95]{Come95}  
Comer,
```

D. E., {\it Internetworking with
TCP/IP:

Principles, Protocols and
Architecture},

volume 1, 3rd edition. Prentice-Hall,
1995.

```
\end{thebibliography}
```

Bibtex

```
@book{Come95,
```

```
author="D. E. Comer",
```

```
title={Internetworking with TCP/IP: Princip  
les, Protocols and Architecture},
```

```
publisher="Prentice-Hall",
```

```
year=1995,
```

```
volume=1,
```

```
edition="Third"}
```

Output Formats



- .dvi Device Independent
- .ps Post Script
- .pdf PDF
- .rtf Rich Text Format
- .html HTML
- .xml XML

- Overleaf is a **collaborative** cloud-based LaTeX editor.
- Used for **writing**, **editing** and **publishing** scientific documents.
- It partners with a wide range of **scientific** publishers to provide official journal LaTeX templates, and direct submission links.



www.overleaf.com

Final Words: Try and Try ...



- You have already taken your **first step** by attending this session.
- **Enjoy** writing with LaTeX

Books

- Leslie Lamport. 1994. LaTeX: A Document Preparation System.
- Helmut Kopta and Patrick W. Daly. 2004. Guide to LaTeX
- Frank Mittelbach et al. 2004. The LaTeX Companion

