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Intro to \LaTeX

December 11-12, 2013.

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What is L^AT_EX?

- mark-up language and document preparation system
- originally invented in 1980s by Leslie Lamport - mature, powerful
- provides high level language on top of T_EX (Donald Knuth)
- continues to be widely used in academia, publishing and industry
- particularly well suited for developing complex documents and books
- excellent support for type-setting formulas and equations - widely used in mathematics and physics

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Latex Learning curve versus Word

- analogous to admd and Excel

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Latex Basics

- philosophy remove formatting and presentation concerns from author
- author focuses on basic document structure and content, \LaTeX handles typesetting, formatting and cross references
- add-on-packages (<http://www.ctan.org>) provide additional functionality
- different than Word and other “What-You-See-Is-What-You-get” applications
- \LaTeX uses plain text files (*.tex)

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A Minimal Example

Example (/examples/0_minimal_latex/min.tex)

```
% minimal latex example
\documentclass{article}
\begin{document}
  \LaTeX{} is a document preparation system for the
  \TeX{}typesetting program.
\end{document}
```

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Pre-amble

- precedes the `\begin{document}` command
- loads required packages
- document specific settings
- possible to define macros

Examples

```
\documentclass[12pt,letterpaper]{article}
\usepackage{longtable}
\usepackage{ctable}
\graphicspath{{figures/}}
\title{Fill in title here}
\author{Your Name}
```

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Top Matter

Example

```
\title{Basic \LaTeX{} Document Structure}  
\author{Homer Simpson\\  
  742 Evergreen Terrace,\\  
  Springfield,\\  
  United States,\\  
  123456\\  
  \texttt{hsimpson@simpsons.com}}  
\date{\today}  
\maketitle
```

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Sections

- define document structure with sections

Examples

```
\section{Introduction}  
\subsection{A Subsection Under Introduction}  
\subsubsection{A Subsubsection}  
\paragraph{paragraph}  
\subparagraph{subparagraph}  
% suppress numbers with asterisk  
\section*{Introduction}
```


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Environments

- provide specific functionality associated with type setting various document components
- examples include tables, figures
- environments can be nested within one another

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Figures

Example

```
\begin{figure}  
  \begin{center}  
    \includegraphics[width=\textwidth]{figurename}  
  \end{center}  
  \caption[short caption]{full caption}  
  \label{fig:figurename}  
\end{figure}
```

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Tables

Example

```
\begin{table}
  \begin{center}
    \begin{tabular}{l r }
      Name & Value \\
      \hline
      row1col1 & row1col2 \\
      row2col1 & row2col2 \\
    \end{tabular}
  \end{center}
  \caption[shortcaption]{full table caption}
  \label{tbl:simpletable}
\end{table}
```

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References

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Abstracts

- so common have designated environment

Example

```
\begin{abstract}  
Your abstract goes here...  
...  
\end{abstract}
```

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Multi-part Documents

- for multiple parts documents use `\include{}`
- `main.tex` contains preamble and document-wide settings (TOC, lists of figure and tables, etc.)

`main.tex`

```
...    % preamble
\begin{document}
...
\include{first_chapter.tex}
\include{second_chapter.tex}
\include{third_chapter.tex}
...
\end{document}
```

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Resources

- Official Repository of packages:

<http://www.ctan.org/>

- Useful tutorial

<http://www.andy-roberts.net/writing/latex>

- symbols
- TexStackExchange (similar to stackoverflow.com)

<http://tex.stackexchange.com/>

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Recap