LATEX; Hands On workshop

Ata Jahangir Moshayedi, University of Pune
WORKSHOP
ON
INTRODUCTION TO LATEX
Date: 8th September 2013
Time: 08:00 to 12:30
Organized by
DEPARTMENT OF ELECTRONIC SCIENCE
UNIVERSITY OF PUNE
And
ISLAMIC ASSOCIATION
RANIAN STUDENTS IN PU
One day Hands workshop on \LaTeX

8 Sep 2013

Ata Jahangir Moshayedi
PhD Student Does, UOP
LM society of instrument of India
IEEE _ Graduate Student Member
To whom that afraid of Latex
AGENDA

• Lecture Part 1: Introduction
  – Why do you want to learn LaTeX?
  – Nuts and Bolts of LaTeX

• Lecture Part 1: Practical Examples
  – Some useful example
  – Review on IJAPER Journal Format
Lecture Part 1: \textsc{LaTeX} Introduction
WHY YOU WANT TO **L A T E X**

- Very powerful control of document generation, particularly large technical documents
- Minimizes the drudgery of formatting, numbering, and referencing

**Disadvantage:**

*Steep Learning Curve*
Unique Advantages of LaTeX

✓ 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**
Disadvantages of using LaTeX

✓ “Hard to write disorganized documents”*
✓ Learning Curve
✓ Customizing is tedious.
Some History

• LATEX developed by Donald Knuth in 1977

• Pronounced /tɛk/ because it comes from the Greek word τεχνη

• Leslie Lamport developed LATEX in the early 80's on top of TEX to make it easier to use
History

• **LaTeX**: computer program released in 1982 by **Donald E. Knuth** and written for typesetting digital documents
What You See Is What You Get

MS Word vs LaTeX

What You See Is What You Mean
MS Word vs LaTeX

WHAT DO U THINK?
WE SHOULD BREAK THIS GRAPH
LaTex Structure

- ✓ Class File
- ✓ Command
Class File

• Defines what your document will look like
• Selected by \documentclass command
  – \documentclass[options]{class_name}
• Some examples:
  – amsart.cls (included with basic download)
    • \documentclass[]{amsart}
  – IEEEtran.cls (download)
    • Specify font size, number of columns, format, etc
    • \documentclass[10pt,conference]{IEEEtran}
document styles

Type of Documents

\documentclass{article}
\documentclass{book}
\documentclass{letter}
\documentclass{report}
Commands

• Used to help organize the document
  – Section headings
  – Labels and Cross-References
  – Figures
  – Tables
  – Equations
  – Listing Options
  – Miscellaneous: newpage, pagestyle, include...
  – Bibliographic Referencing
LaTeX Platforms

• Scientific Workplace
  — (Commercial Package)
• UNIX Systems (LyX)
  — (Free)
• MikTeX and WinEdit (Free)
  — PC Shareware
• Text studio
The LaTeX Process

1. Create a text file (with your favorite text editor) with LaTeX commands
2. “Compile” or “Build” your document using the LaTeX program
3. Display resulting Document
4. Continue writing and go to 1 until finished
5. Convert Document to Postscript or PDF
Getting Started

• Personal Computers
  – Windows
    • Mike Text & Text studio
    • TeXnicCenter
    • proTeXt
  – Linux
    • TeXLive
  – Mac
    • LyX & MacTeX
Parts of a LaTeX Document: \texttt{\textbackslash documentclass}

\texttt{\textbackslash documentclass}

- First line of all LaTeX documents
- Specifies the type of the document

\texttt{\textbackslash documentclass[aae]\{puthesis\}}
Parts of a LaTeX Document:

Environment

Start with
\begin{...}

End with
\end{...}

\begin{document}
\begin{equation}
...
\end{equation}
\end{document}
\documentclass{article}
\begin{document}
Welcome to LaTex you can see its not that much difficult.
\end{document}

Welcome to LaTex you can see its not that much difficult.
Sections

\section{Section Title}

\subsection{Title}

\subsubsection{Title}
Mathematics

Greek Symbols
\( \alpha, \beta, \gamma \)

Superscript, Subscript
\( x^y, x_y, x_y^z \)

Calculus
\( \int_0^\infty, \int \left\{ \int \right\}, \frac{\partial u}{\partial x} \)

Don’t worry.. You have excellent reference sheets available for all these symbols and more
Output Formats

- **.dvi**  Device Independent
- **.ps**   Post Script
- **.pdf**  PDF
- **.rtf**  Rich Text Format
- **.html** HTML
- **.xml**  XML
Final Words: Try it ...

- You have already taken your first step by attending this session.
- Enjoy writing with LaTeX
- Spread the joy of using LaTeX.
is a peer-reviewed, multidisciplinary and open access journal established in **Australia**. The journal publishes original theoretical and applied papers on all aspects of applied electronics in physics and robotics. Before publication, both general and technical aspects of the submitted paper are reviewed. The online versions of IJAEPRE papers can be downloaded free of charge.
TeXstudio is an integrated environment for writing LaTeX documents.
Text studio
\documentclass[10pt, a4paper]{article}
\usepackage[utf8]{inputenc}
\usepackage{amsmath}
\usepackage{amssymb}
\begin{document}

\textit{TeXMaker} is a cross-platform \LaTeX{} editor.

Here you can see the spell-checking on different mispelled words: They are automatically underlined.

Mathmode:
\[
\sum_{i=1}^{n} \left( i^2 \right)
\]
\end{document}
Lecture Part 2: \textsc{LATEX} Examples
\documentclass{article}
\begin{document}
Hi i like latex
\end{document}
\documentclass{article}
\begin{document}
\emph{I like } Latex.
\end{document}
\documentclass{article}
\begin{document}
\emph{i must} learn \underline{latex}.
\end{document}
Making references in LaTeX

\documentclass{article}
\begin{document}
\emph{i must} learn \underline{latex}
\cite{WF}.
\begin{thebibliography}{99}
\bibitem{WF}
Moshayedi Ata Jahangir,\emph{Ph.D student}
\end{thebibliography}
\end{document}
i must learn latex [1].

References

[1] Moshayedi Ata Jahangir, Ph.D student

i must learn latex [1].

References

[1] put your name, Put your degree
\documentclass{article}
\begin{document}
\begin{equation} \label{E:sum}
  s = \sum_{i=1}^{n} x_i
\end{equation}
\end{document}
\[ s = \sum_{i=1}^{n} x_i \] (1)
Sum of Squares Equation Example

\documentclass{article}
\begin{document}

\begin{equation}
\label{E:sum_squares}
 s^2 = \sum_{i=1}^{n}x_i^2
\end{equation}

\end{document}
\[ s^2 = \sum_{i=1}^{n} x_i^2 \] (1)
\documentclass{article}
\begin{document}
\begin{equation}
\label{E:mean}
\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}
\end{equation}
\end{document}
\[ \bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \] (1)
\documentclass{article}
\begin{document}

\begin{equation} \label{E:mean}
\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}
\end{equation}

\end{document}
\documentclass{article}
\begin{document}

\begin{equation} \label{E:variance}
\sigma^2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}
\end{equation}

\end{document}
Ata Jahanmir Moshayedi

\documentclass{report}
\begin{document}
\chapter{Standard Deviation}
\begin{equation}\label{E:sd}
\sigma = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n - 1}}
\end{equation}
\end{document}

σ = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n - 1}} \quad (1)
Report document style (main.tex)

\documentclass{report}
\title{How To learn Latex}
\author{Moshayedi Ata. Jahangir\~no}
\begin{document}
\maketitle
\tableofcontents
\end{document}
How To learn Latex

Moshayedi Ata.Jahangiriro

June 17, 2012
Create the following chapters

chapter_sum.tex
chapter_mean.tex
chapter_sd.tex
\documentclass[]{book}
\begin{document}
\chapter{How we can learn Latex}
  \label{C:First Part}
\begin{equation} \label{E:mean} \bar{x} = \frac{\sum_{i=1}^{n}x_i}{n} \end{equation}
\end{document}

This line must be because we specify the chapter.
Chapter 1

How we can learn Latex

\[ \bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \]  (1.1)
\documentclass[]\{book\}

\begin{document}
\chapter{How we can learn Latex} \label{C:First Part}

\begin{equation} \label{E:mean} 
\bar{x} = \frac{\sum_{i=1}^{n}x_{i}}{n}
\end{equation}

\chapter{we must learn Latex} \label{C:we must learn Latex}
\begin{equation} \label{E:sum} 
s = \sum_{i=1}^{n}x_{i}
\end{equation}

\end{document}
Chapter 1

How we can learn Latex

\[ s = \sum_{i=1}^{n} x_i \] (1.1)

Chapter 2

we must learn Latex

\[ s = \sum_{i=1}^{n} x_i \] (2.1)
\documentclass[book]{book}
\begin{document}
\chapter{How we can learn Latex} \label{C:First Part}
\begin{equation} \label{E:mean}
\bar{x} = \frac{\sum_{i=1}^{n}x_{i}}{n}
\end{equation}
\chapter{we must learn Latex} \label{C:we must learn Latex}
\begin{equation} \label{E:sum}
s = \sum_{i=1}^{n}x_{i}
\end{equation}
\chapter{Standard Deviation} \label{C:SD}
\begin{equation} \label{E:sd}
\sigma = \sqrt{\frac{\sum_{i=1}^{n} \left(x_{i} - \bar{x}\right)^{2}}{n-1}}
\end{equation}
\end{document}
Chapter 1
How we can learn Latex

\[ z = \frac{\sum_i z_i}{n} \]  (1.1)

Chapter 2
we must learn Latex

\[ r = \sum_{i} c_i \]  (2.1)

Chapter 3
Standard Deviation

\[ r = \frac{\sum (z_i - \bar{z})^2}{n-1} \]  (3.1)
Modify main.tex to include chapters

\documentclass{report}
\title{Assignment 2 for SIMG726}
\author{Rolando V. Raque\~no}
\begin{document}
\maketitle
\tableofcontents
\include{chapter_sum}
\include{chapter_mean}
\include{chapter_sd}
\end{document}
Contents

1 How we can learn Latex 7
2 We can learn Latex 8
3 Latex benefits 11

Chapter 1

How we can learn Latex 11
We can see that equation \ref{E:sd} uses equation \ref{E:mean} to compute the mean and that the \texttt{Mean} function uses equation \ref{E:sum} both of which are defined in Chapter \ref{C:Sum} and \ref{C:Mean}, respectively.
Chapter 3

Latex benefits

\[ \sigma = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n - 1}} \]  

(3.1)

We can see that equation 3.1 uses equation 1.1 to compute the mean and that the Mean function uses equation 2.1 both of which are defined in Chapter ?? and ??, respectively
Including graphics in a LaTeX document

• The two methods are
• include only PostScript images (esp. ``Encapsulated PostScript'') if your goal is a PostScript document using dvips
• include **only** PDF, PNG, JPEG and GIF images if your goal is a PDF document using pdflatex, TeXShop, or other PDF-oriented compiler.

Just put your image with PNG or PS format in the same folder of Latex file
\documentclass[]{article}
\begin{document}
\begin{table}[position specifier]
\centering
\begin{tabular}{|l|}
\hline
... your table ...
\hline
\end{tabular}
\caption{This table shows some data}
\label{tab:myfirsttable}
\begin{tabular}{ l c r }
1 & 2 & 3 \\
4 & 5 & 6 \\
7 & 8 & 9 \\
\end{tabular}
\end{table}
\end{document}
ADD TABLE

\documentclass[]\{article\}
\begin\{document\}
\begin\{tabular\}{l*{6}{c}r}
Team & P & W & D & L & F & A & Pts \\
\hline
Manchester United & 6 & 4 & 0 & 2 & 10 & 5 & 12 \\
Celtic & 6 & 3 & 0 & 3 & 8 & 9 & 9 \\
Benfica & 6 & 2 & 1 & 3 & 7 & 8 & 7 \\
FC Copenhagen & 6 & 2 & 1 & 2 & 5 & 8 & 7 \\
\end\{tabular\}

\end\{document\}
Using the existing format

- Open the file
  ijaepr_submission_LaTeX_template/ijaepr_sample.tex
• \documentclass[twocolumn,a4paper,reqno]{article}

Don’t touch them

\usepackage{ijaeprsub}
\usepackage{amsfonts}  \textit{Font for formula}
\usepackage{mathtools} \textit{Origin and .....}
<table>
<thead>
<tr>
<th>Command</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>\leftthreetimes</td>
<td>amssymb</td>
</tr>
</tbody>
</table>

Operator symbols:

- \pm, \mp, \div, \times, \ast, \bullet
- \star, \circ
- \bigotimes, \bigodot
- \sqcup, \sqcap
- \bigvee, \bigwedge
- \approx, \approx
- \min, \max
- \int, \oint
- \arg, \arccos, \arcsin, \arctan
How to split the word

• \texttt{\textbackslash hyphenation\{im-pe-da-nce\}}
• \texttt{\textbackslash hyphenation\{st-a-ges\}}
• \texttt{\textbackslash hyphenation\{doub-lers\}}
• \texttt{\textbackslash hyphenation\{doub-ler\}}
• \texttt{\textbackslash hyphenation\{Fis-cher\}}
• \texttt{\textbackslash hyphenation\{con-fi-gura-tion\}}
Making header

• \maketitle \(\Rightarrow\) making the header form the top of paper

• \bibliographystyle{IEEEtranN} Format Biblo

• \bibliography{bbl}

• \section*{Appendix} Without number
Put reference

- .bbl files
• @article{moshayedi2013brief, title={Brief comparison between 8051 and AVR}, author={Moshayedi, Ata Jahangir}, year={2013} }
Find the difference

• \citeauthor{ata2000} ➔
• \citeyear{ata2000} ➔
• \citeauthor{ata2000} ➔
• \cite{ata2000} ➔
Picture

• \texttt{\fref{Fig:smplfig}}. Make the reference for figure
\documentclass{article}
\usepackage[pdftex]{graphicx}
\begin{document}
This is my first image.
\includegraphics[angle=45]{myimage.png}
That's a cool picture up above.
\end{document}
\documentclass{article}
\usepackage[pdftex]{graphicx}
\begin{document}

This is my first image.

\includegraphics*[viewport=30 30 120 120]{myimage.png}

That's a cool picture up above.

\end{document}
%center text or images using \begin{center} and \end{center}.
\documentclass{article}
\usepackage[pdftex]{graphicx}
\begin{document}
This is my first image.
\begin{center}
\includegraphics{myimage.png}
\end{center}
That's a cool picture up above.
\end{document}
\documentclass{article}
\usepackage{graphics}
\begin{document}
\begin{figure}
\includegraphics{MyCat.ps}
\caption{This is My Cat}
\label{F:MyCat}
\end{figure}
\end{document}
References

• Jim Tyson, “LaTeX with BibTex” Wednesday, November 29, 2006
• http://www.math.uiuc.edu/~hildebr/tex/packages.html
• http://www.elsevier.com/wps/find/authorsview.authors/elsarticle
• http://www.elsevier.com/wps/find/authorsview.authors/elsarticle
• SciPS course, Intermediate LaTeX
• Arun K. Subramaniyan, introduction on LaTeX
• Ronald R, Quick LaTeX Tutorial
• André Heck, Learning LATEX by Doing
• University of California, A Very Short Introduction to LaTeX
• Jim Tyson, LaTeX with BibTex
• Jim Alexander, A LATEX Tutorial
• Toon Goedemé, LaTeX writing professional scientific texts