Document design in LaTeX

The motivation

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The LaTeX workshop

Outline

Outline

A brief history

Why should I use LaTeX

- I do not wish to use “commercial” software
- I am not happy with the mathematical rendering of the “Commercial software”
- Too much mathematical content in my documents and I am tired of the click-find-click-type-repeat
- Math makes my documents look badly formatted
- I like typing more than clicking
- I would like to explore

Outline

Our requirements

The basic tools

- A LaTeX distribution
- A LaTeX document editor: preferably one which can edit LaTeX documents and compile them too.
- A document visualizer: preferably a PDF viewer

The advanced tools

- A bibliography management software
- A WYSIWYG editor
- A GUI environment for drawing plots / graphs of functions
- Image editing software

In this session, we present the basic tools for design.

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Getting our machinery ready

On Microsoft Windows

- LaTeX distribution:
  - MikTeX (`www.miktex.org`).
  - Download the basic installer. Installs required packages 'on-the-fly'.
- LaTeX Editor:
  - Open Source: TeXnicCenter (`www.texniccenter.org`)
  - Commercial: WinEdt
  - With the distribution: TeXWorks recommended
- PDF Viewer: Adobe Acrobat Reader (freely downloadable)

Getting our machinery ready

On Linux

- LaTeX distribution: TexLive
  - Debian based: `sudo apt-get install texlive`
  - Red Hat based: `sudo yum install texlive`
- LaTeX Editor:
  - TeXworks
  - TeXStudio
  - GEdit with the LaTeX plugins
- PDF Viewer: Evince, Okular

Linux Systems

- Debian based: Debian, Ubuntu, Mint, Pinguy, ...
- Red Hat based: RHEL, Febora, Suse, ...

Outline

Dissecting a LaTeX file

Properties

- File extension: .tex
- File parts
  - The preamble
  - The body

The preamble

Contents

- Announcement of the class template: Typically `\documentclass[a4paper,10pt]{article}`
- Optional: List of packages to be used. Looks like `\usepackage{...}`
- Optional: Font face specifications
- Optional: Definitions and other macros

The body

Contents

- Sections, subsections and subsubsections
- Math: Inline, Display and equations
- Figures
- Tables

Typical body layout

```
\begin{document}
\section{My first section}
\subsection{My sub section}
\subsubsection{More details}
\subsection{Another sub section}
\subsubsection{Some more details}
...
\end{document}
```

Typesetting mathematics

Inline, display and equations

All inline math have to be surrounded by $, display math by $$, and equations by \begin{equation} ... \end{equation}

Source

```
The second order algebraic
polynomial is given by $x^2
+ x + 1$. This can be
written in the display
mode as
$$ x^2 + x + 1. $$
The equation of the
circle with radius $a$
is given as
\begin{equation}
x^2 + y^2 = a^2
\end{equation}
```

Output

The second order algebraic polynomial is given by $x^2 + x + 1$. This can be written in the display mode as

$$x^2 + x + 1$$

The equation of the circle with radius a is given as:

$$x^2 + y^2 = a^2 \tag{1}$$

More details on mathematical typesetting are in my presentation: Typesetting Mathematics in LaTeX: Getting your hands dirty

Setting up tables

```
\begin{table}
\centering
\begin{tabular}{|l|c|r|c|}
\hline
Clothing & Quantity & Rate & Place \\ \hline
Paithani & 1 & 1135.00 & Marathwada \\ \hline
Baluchari &2 &1345.00 &Orissa \\ \hline
Banarasi & 5 & 923.00 &Uttar Pradesh \\ \hline
\end{tabular}
\end{table}
```

Clothing	Quantity	Rate	Place
Paithani	1	1135.00	Marathwada
Baluchari	2	1345.00	Orissa
Banarasi	5	923.00	Uttar Pradesh

l - indicates left justified column, r - indicates right justified column and c - indicates center justified column. More details are covered in **Writing Journal papers in LaTeX: A complete tour**

Setting up images

This requires
`\usepackage{graphicx}`
in the preamble

```
\begin{figure}
\centering
\includegraphics[width=0.8\textwidth]{dumbledore.jpg}
\caption{Dumbledore passes away}
\end{figure}
```

Figure : Dumbledore passes away

This image has been taken from
`http://harrypotter.wikia.com`.

Outline

Compiling the LaTeX code

The compilation can be done with

- `latex` - produces DVI files
- `pslatex` - produces PS files
- `pdflatex` - produces PDF files

If the name of the file is `mypaper.tex` the command lines are:

- `latex mypaper.tex`
- `pslatex mypaper.tex`
- `pdflatex mypaper.tex`

LaTeX editors like TeXnicCenter, WinEdt, TeXworks, Kile, TeXStudio automatically run these commands based on the preferences set.