CSIP5403: Research Methods and Applications

Lecture 9: Typesetting Documents with LaTeX

Other Document Structures

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Outline

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Logos

Example (Source)

```
\TeX{}
\LaTeX{}
\LaTeXe{}
```

Output

TEX
LATEX
LATEX 2ε

Quotation marks

Do not use

The " as you would on a typewriter

Use

Two `s (grave accent) for opening quotation marks and
two ′s (vertical quote) for closing quotation marks

Put in Preamble

```
%DOUBLE QUOTE and SINGLE QUOTE Commands
\newcommand{\qq}[1]{\textquotedblleft#1\textquotedblright}%
\newcommand{\q}[1]{\textquoteleft#1\textquoteright}%
```

Example (Use)

\qq{*text and more text*} will produce “text and more text”
\q{*text and more text*} will produce ‘text and more text’

$\star$-form

- Some commands have a $\star$-form in addition to their normal appearance
- A $\star$ is added to their name to modify their functionality

Example

The $\star$-form of the command $\backslash$*section* is $\backslash$*section*$\star$

- No section number is printed
- No entry in the table of content is made

Packages

- Load packages that add new features to the LaTeX system.
- To load a package you use the command

$$\usepackage\{names\ of\ package\}$$

Example

To include graphics in a document we use the following package

$$\usepackage\{graphicx\}$$

Table of Contents

- LaTeX can prepare and print a table of contents automatically
- Will contain the section numbers, the corresponding headings and the page number on which they begin
- By default
  - Book and Report: up to level subsection
  - Article: up to level subsubsection

Printing the Table of Contents

Will appear where the following command is placed

\tableofcontents

Note

LaTeX needs to be run twice for table of contents to appear in a document

Other Lists

List of Figures

listoffigures

List of Tables

listoftables

Note

LaTeX needs to be run twice

Footnotes

Example (Source)

```
The command  comes immediately after the word requiring an
explanation in a footnote and will produce an auto-numbered
footnote where you put the command, and the note will be
printed at the foot of the page\footnote{There is a package
to hold over your footnotes and make them print at the end
of the chapter or whole document instead (endnote)}
```

Output

The command comes immediately after the word requiring an explanation in a footnote and will produce an auto-numbered footnote where you put the command, and the note will be printed at the foot of the page[a]

[a] There is a package to hold over your footnotes and make them print at the end of the chapter or whole document instead (endnote)

Marginal Notes

Generated with the command

\marginpar[*left marginnote text*]{*right marginnote text*}
puts the note at the level of the line where the command is given

Line Breaking

- Occurs automatically in LaTeX
- However, if needed then use one of the following:

Commands

\\[*space*] – inserts additional vertical space before the next line
\\ $\star$ [*space*] – also prevents a page break from occurring between current and next line
newline – equivalent to \\

Page Breaking

Command

newpage – to end a page in the middle, fill it with blank, and go on to a new page
clearpage – in addition to the above, outputs all pending figures and tables on one or more extra pages

Bad Page Break

- Sometimes the automatic break page is not a good one
- The difference of a few points could be all that is necessary to avoid it

Commands

\enlargethispagesize{*size*} – add length size for this one page only
\enlargethispagesize$\star$ {*size*} – also shrinks any interline spacing as needed to maximise the amount of text on the page

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Interline Spaces

Commands

\singlespacing
\onehalfspacing
\doublespacing

Spacing between Paragraphs

Commands

\vspace{*space*} - insert blank space of width *space*
\bigskip
\medskip
\smallskip

More Space Commands

Commands

hspace{*space*} - insert blank space of width *space* - a blank before and after the command will also be included
hfill - insert enough space to force the text on either side to be pushed over to the left and the right margins
dotfill - dots instead of blank space
rulefill - ruled line instead of blank space

LaTeX Environments

Start with

$$\backslash begin\{...\}$$

and end with

$$\backslash end\{...\}$$

putting the name of the environment in the curly brackets

Environments can be nested within each other as long as the correct nesting order is maintained

Abstract

- Immediately after the \maketitle

```
\begin{abstract}
This is my summary ...
\end{abstract}
```

- LaTeX lets you change the name associated with the abstract environment

Example (Place in Preamble)

```
\renewcommand{\abstractname}{Executive Summary}
```

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Itemize, Enumerate, and Description

Example (Source)

```
\begin{itemize}
  \item First
  \item Second
  \item Third
\end{itemize}
```

Output

- First
- Second
- Third

Itemize, Enumerate, and Description

Example (Source)

```
\begin{enumerate}
  \item First
  \item Second
  \item Third
\end{enumerate}
```

Output

1. First
2. Second
3. Third

Itemize, Enumerate, and Description

Example (Source)

```
\begin{description}
  \item[First] One
  \item[Second] Two
  \item[Third] Three
\end{description}
```

Output

First One

Second Two

Third Three

Itemize, Enumerate, and Description

Example (Source)

```
\begin{enumerate}
\item You can mix list
environments:
\begin{itemize}
\item But it might start to
\end{itemize}
\item Therefore remember:
\begin{description}
\item[Stupid] things
\item[Smart] things
\end{description}
\end{enumerate}
```

Output

1. You can mix list environments:
   - But it might start to
2. Therefore remember:

   Stupid things

   Smart things

Quote and Quotation

Quote For important phrases, or small paragraph

Quotation For quotes that go beyond one paragraph, because it indents the first line of each paragraph

Example (Source)

```
A typographical rule of
thumb for the line length is:
\begin{quote}
On average, no line should be
longer than 66 characters.
\end{quote}
This is why multicolumn print
is used in newspapers.
```

Output

A typographical rule of thumb for the line length is:

> *On average, no line should be longer than 66 characters.*

This is why multicolumn print is used in newspapers.

Tables

Output

Table: Project expenditure to year-end 2003

	Item	Amount
a)	Salaries (2 research assistants)	28,000
	Conference fees and travel expenses	14,228
	Computer equipment (5 workstations)	17,493
	Software	3,562
b)	Rent, light, heat, power, etc;	1,500
	Total	64,783

Tables

Example (Source)

```
\begin{table}
\caption{Project expenditure to year-end 2003}
\label{year2003exp}
\begin{center}
\begin{tabular}{|c|l|r|} \hline
 & Item & Amount\\ \hline \hline
 a)& Salaries (2 research assistants)    &28,000\\
   & Conference fees and travel expenses &14,228\\
   & Computer equipment (5 workstations) &17,493\\
   & Software                            &3,562\\
 b)& Rent, light, heat, power, etc;      &1,500\\
 \hline \hline
   & Total                               &64,783\\\hline
\end{tabular}
\end{center}
\end{table}
```

Figures

- To create a figure, use the figure environment

$$
\begin{aligned}
&\backslash begin\{figure\}\\
&\backslash centering\\
&\backslash includegraphics[width = 5cm]\{Myfigurename\}\\
&\backslash caption\{\text{Here it comes the title of the figure}\}\\
&\backslash label\{textforcross - reference\}\\
&\backslash end\{figure\}
\end{aligned}
$$

- LaTeX: Encapsulated PostScript (EPS) format
- PDFLaTeX: Joint Photographic Experts (JPG), Portable Network Graphic (PNG), or PDF format (not EPS)

Cross-references

- This is one of the most powerful features of LaTeX
- You can label any point in a document with a name you make up

$$\backslash label\{textforcross-reference\}$$

- Then refer to it by that name from anywhere else in the document

$$\backslash ref\{textforcross-reference\}$$

$$\backslash pageref\{textforcross-reference\}$$

- LaTeX will always work out the cross-reference number for you
- No matter how much you edit the text or move it around

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Bibliographic Citations

- A similar method is used to cite documents in a bibliography or list of references
- There are packages to sort and format these in the correct manner for different journals
- Two ways to include a bibliography in a document
  - by hand
  - with BIBTEX

By hand

The list of references go in the LaTeX environment

```
\begin{thebibliography}{99}
⋮
\end{thebibliography}
```

- Use of the command \bibitem{chi98}Document details
- chi98 is a keyword you make up to remember the document to cite
- Use the command \cite{chi98} to cite a particular reference in the text

Example

The paper [1] is interesting and well cited. The paper [2] was published in the journal IEEE Transaction on Fuzzy Systems and deals with . . .

[1] F. Chiclana, F. Herrera, E. Herrera-Viedma, “Integrating three representation models in fuzzy multipurpose decision making based on fuzzy preference relations.” *Fuzzy Sets and Systems* 97 (1) pp. 33–48, JULY 1998, Times Cited: 44

[2] E. Herrera-Viedma, L. Martínez, F. Mata, F. Chiclana, “A consensus support system model for group decision-making problems with multi-granular linguistic preference relations,” *IEEE Transactions on Fuzzy Systems* 13 (5) pp. 644–658, OCT 2005, Times Cited: 4

BibTeX: The LaTeX Bibliography Database

- Manages bibliographic references automatically
- Reduces the time needed to maintain and format them
- Dramatically improves accuracy
- Using BibTeX means you only ever have to type the bibliographic details of a work once
- You can then cite it in any document you write, and it will get reformatted automatically to the style you specify

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Page Style

With one exception, given in preamble

\pagestyle{style}

plain	page head empty; foot contains centred page number; default for article and report
empty	page head and foot are empty; no page numbers are printed
headings	head contains page number and chapter and section headings; foot empty; default for book
myheadings	the same as headings but titles are given explicitly with commands \markright or \markboth

\thispagestyle{style}

affects only the current page in which it is placed

For styles headings and myheadings

Information appearing in the headline may be given with the declarations
\markright{*right head*} - one sided output
\markboth{*left head*}{*right head*} - twoside option

Customised Headings

- Loading the package fancyhdr an additional page style named fancy is available
- Head and footlines consists each of three parts: left, centre and right

$\backslash fancyhead[L]\{left\ head\}$ $\backslash fancyfoot[L]\{left\ foot\}$

$\backslash fancyhead[C]\{centre\ head\}$ $\backslash fancyfoot[C]\{centre\ foot\}$

$\backslash fancyhead[R]\{right\ head\}$ $\backslash fancyfoot[R]\{right\ foot\}$

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Font Size

\size{} or {\size text}

Example (Command)

```
\normalsize
\small
\footnotesize
\scriptsize
\tiny
```

Output

normal

small

smaller

very small

smallest

Font Size

Example (Command)

```
\normalsize
\large
\Large
\LARGE
\huge
\Huge
```

Output

normal
large
larger
even larger
still larger
largest

Font Commands

Example (Source)

```
\textbf{boldface}
\emph{emphasis}
\textit{italic}
\underline{underline}
```

Output

boldface
emphasis
italic
underline

Global Command of Fonts

Example (Source)

```
\rmfamily
\sffamily
\ttfamily

\mdseries
\bfseries

\upshape
\itshape
\slshape
\scshape
```

Output

rmfamily
sffamily
ttfamily

mdseries
bfseries

upshape
itshape
slshape
SCSHAPE

URLs

In Preamble load the package url

```
Visit \url{http://www.cci.dmu.ac.uk}
```

Visit http://www.cci.dmu.ac.uk

Hypertext Links load the package hyperref

```
Last command into the preamble of your document
\usepackage[pdftex]{hyperref}
Visit \href{http://www.cci.dmu.ac.uk\}{CCI}
```

Visit CCI

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Package geometry for Page Margins

In Preamble

```
\usepackage
[paper=a4paper,left=2cm,right=2cm,top=2cm,bottom=2cm]
{geometry}
```