**\TeX** and **\LaTeX**

Document preparation tools

This lecture adds to the previous introduction to **\LaTeX**, introduces **Bib\TeX** and looks at creating larger documents.

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**Last time ...**

The first session introduced:

– advantages and disadvantages of **\LaTeX**

– the software available in the School: **\LaTeX**, xdvi and dvipdf

– a simple document structure in **\LaTeX** including

  • titlepages, sections, paragraphs, new lines and footnotes

– creating tables in **\LaTeX**

– figures in **\LaTeX**
This time ...

- More syntax of \LaTeX
- More on fonts, centring, itemizing, etc
- Bibliographies, including
  - making a bibliography database
  - using BibTeX and various citation styles
- Creating multi-file documents with
  - an index
  - appendices

Spaces

For those use to WYSIWYG, spaces in \LaTeX{} are confusing.

Space, tab and end-of-line are treated “end of word”.

Lots of space = one space.

Space after “\…” commands is ignored - hence use (e.g.)
\LaTeX{} likes
A very short introduction to the “math mode”

A principal claim for \LaTeX is that it sets mathematical expressions very well.

\LaTeX is, by default, in text mode. You have to switch into and out of math mode using:
– the characters “$”…“$” for maths in text;
– the commands \[ \ldots \] for maths on a separate line.

Simple examples:

\[
\alpha, \beta, \gamma, \Gamma, \mathbb{N}, \emptyset
\]

In text $e=mc^2$ and $\frac{1}{2n-1}$.

In text $e=mc^2$ and $\frac{1}{2n-1}$. 
Fonts in LaTeX

Controlling fonts:
\texttt{...} \rightarrow Research Skills
\textit{...} \rightarrow Research Skills
\textbf{...} \rightarrow Research Skills
\textsc{...} \rightarrow Research Skills

These can be embedded:
\texttt{\textit{\textbf{...}}} \rightarrow Research Skills

Centring

An example of a LaTeX environment:

Centring centres:

\begin{center}
Some text to be centred
\end{center}

Some text to be centred
Verbatim

Another example of a \LaTeX environment:

Verbatim is a way of getting text to appear exactly as you type, e.g. for outputting program text:

\begin{verbatim}
type Term = Term;
\end{verbatim}


\begin{verbatim}
type Term = Term;
\end{verbatim}

Itemizing and enumerating

Getting a list of items is simple:

\begin{itemize}
\item First item
\item Middle item
\item Last item
\end{itemize}
Itemizing and enumerating

Changing to a numbered list involves changing \texttt{itemize} to \texttt{enumerate}.

\begin{enumerate}
  \item First item
  \item Middle item
  \item Last item
\end{enumerate}

Referencing and references - 1

It is essential to support your writing by reference to background material:
– to show where you have used other people’s ideas (i.e. to avoid plagiarism);
– to direct the reader to greater detail than you can give;
– to give authority to what you are writing about.
Referencing and references - 2

Referencing is:
some kind of “link” from your text to a list of references or bibliography – e.g.

– Vancouver system
There were three journals used in the first section [8, 4, 15].

– Harvard system
There were three journals used in the first section (Nipkow 1998; Cerf 2001; V'yugin 1999). The second section included references to Paulson (2001) as

Referencing and references - 3

A reference the things you refer to.
There were three journals used in the first section [8, 4, 15]. There were three journals used in the first section (Nipkow 1998; Cerf 2001; V'yugin 1999). The second section included references to Paulson (2001) as

A reference list can includes your references and other items you think useful to your reader.

Referencing and references in \LaTeX

Referencing commands are inserted in the \LaTeX\ document.

The reference list or bibliography is held in a separate file or files.

(This allows you to collect lots of references about a topic and use the same list for lots of papers.)

The two are linked when you run \LaTeX\ to form your .dvi document.

Making a Bib\TeX\ file

References are held in Bib\TeX\ files.

These can be created very easily using emacs – which provides Bib\TeX\ templates.

A Bib\TeX\ template consists of
– a label showing what type of item you are describing (e.g. Book, …);
– a unique citation tag (Name:Year:ABC);
– a list of data items.
Making a BibTeX file

Alternatively, you can use a reference manager that includes BibTeX - e.g. JabRef

Prepare a .bib file. This can be done in emacs, which includes extra menus to provide you with templates.

```latex
@Book{sharp65,
    author    = {J.R. Sharp},
    title     = {Some fundamentals},
    publisher = {Deutsch},
    year      = {1965},
}
```
Making references

When a reference is placed in some text, it is necessary to include a command, e.g.:

This is a document with a reference to \cite{doc1} and is very short \cite{doc2}.

What to add to your $\LaTeX$ text

To make $\LaTeX$ pick-up the bibliography file, you need to add two commands to your $\LaTeX$ file (e.g. in a file called bibtex_doc.bib):

\begin{document}
\bibliographystyle{plain}
\bibliography{bibtex_doc}
\end{document}
Inbuilt styles - plain

Reference

There were three journals used in the first section [8, 4, 15].

Reference list


Running Bib\TeX - 1

Getting \LaTeX{} and \BibTeX{} to produce a document can seem alarming until you are used to it.

- \LaTeX{} has to find out what references need to be included
- \BibTeX{} needs to form the references required
- \LaTeX{} needs to add the reference list to the end of the document
- \LaTeX{} needs to form the references from the text to the reference list to the end of the document
Running BibTeX - 2

Thus it is not surprising that it may be necessary to execute the following series of commands to obtain a final document:

- `unix> latex filename.tex`
- `unix> bibtex filename`
- `unix> latex filename.tex`
- `unix> latex filename.tex` (*
- `unix> dvips filename.dvi`
- `unix> lpr –Prothko filename.ps`

Other built-in bibliography styles - unsrt

(plain without sorting)

Reference

There were three journals used in the first section [1, 2, 3].

Reference list

Other built-in bibliography styles - alpha

(very popular with computer scientists)

Reference

There were three journals used in the first section [Nip98, Cer01, Vy99].

Reference list


Changing styles

It is possible to use style files to set up the presentation of the whole document including the references.

This has been done in the document associated with this lecture.

It uses

- chicago.sty package declared in the document preamble;
- chicago bibliography style declared just before the bibliography.
**The Chicago style**

(very popular with journals)

Reference
There were three journals used in the first section (Nipkow 1998; Corf 2001; Vyugin 1999). The second section included references to Paulson (2001) as

Reference list

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**Multi-file documents**

It is often more convenient to work on a larger document in smaller sections.

For instance, a report or thesis can be developed in single chapters.

\LaTeX will automatically set page numbers, references, etc, and it’s possible to print out single chapters as if in a larger book.
Multi-file documents – main file

The main file is essentially like a “normal” LaTeX document – but with file names instead of text:

\documentclass[cup6a]{cupbook}
% preamble ...
\begin{document}
\tableofcontents
\listoffigures
\listoftables
\include{cclp_chapter1}
\include{cclp_chapter2}
\end{document}

Multi-file documents – sub-files

Each “sub-file” looks like a “normal” LaTeX with the preamble missing:

\chapter{Bodies}
\label{chap_bodies}

The forms of CHR rules have been introduced and the function of the guard described.
Adding indexes

Four parts to this process:

Load an indexing package:
\usepackage{makeidx}

Add a command to make the index:
\makeindex

Add one or more index entries:
\index{CHR rules!bodies}

Output the index:
\printindex

Adding appendices

Slightly different from indexes:

Load an appendix package:
\usepackage{appendix}

Create your appendices (like another chapter)

Insert the appendices like chapters:
\renewcommand{\appendixpagename}{Appendix}
\appendix
\appendixpage
\include{cclp_appendix1}