

# Computer Practicum 1

## More LaTeX

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Based on LaTeX tutorial by Claudio Vellage and the Latex for Beginners workbook (University of Edinburgh).

Online LaTeX editor

<https://www.overleaf.com/>

# Fonts and effects

```
\documentclass{article}
\begin{document}
  \section{Section}
  \textbf{Hello World!}

  \subsection{Subsection}
  Structuring a document is
  \underline{easy}!
  \texttt{More text.}
  \emph{Some more text.}
  Even more text.
  \section{Another section}
\end{document}
```

There are several different LaTeX commands for a variety of font effects.

<code>\textit{words in italics}</code>	<i>words in italics</i>
<code>\textsl{words slanted}</code>	<i>words slanted</i>
<code>\textsc{words in smallcaps}</code>	WORDS IN SMALLCAPS
<code>\textbf{words in bold}</code>	<b>words in bold</b>
<code>\texttt{words in teletype}</code>	words in teletype
<code>\textsf{sans serif words}</code>	sans serif words
<code>\textrm{roman words}</code>	roman words
<code>\underline{underlined words}</code>	<u>underlined words</u>

# Coloured texts

```
\documentclass{article}  
\usepackage{color}
```

```
\begin{document}
```

This is some text in black.  
If I want to include some other colour, I can use the command `\color{magenta}` and the text is going to be in new colour}.

What happens if I don't put braces `\color{cyan}` before the command?

```
\end{document}
```

To put coloured text in a document, we have to set a *package* **color** in the preamble:

```
\usepackage{color}
```

The basic colour names that can be used using the **color** package are:

Red, green, blue, cyan, magenta, yellow and white.

To produce the coloured text, use the command:

```
{\color{red}Dummy text}
```

This will set the color of the text to the text in the braces.

You can also define any other color you would like to use.

For more information on how to do that, go to:

<https://en.wikibooks.org/wiki/LaTeX/Colors>

# Font sizes

```
\documentclass{article}
```

```
\begin{document}
```

This is some text in normal font size. I can also get different sizes using special commands like `{\small for small words}`, `{\large for large words}` and even `{\huge for huge words}`.

```
\end{document}
```

You can change font size using the variety of commands:

<code>{\tiny tiny words}</code>	<small>tiny words</small>
<code>{\scriptsize scriptsize words}</code>	<small>scriptsize words</small>
<code>{\footnotesize footnotesize words}</code>	<small>footnotesize words</small>
<code>{\small small words}</code>	<small>small words</small>
<code>{\normalsize normalsize words}</code>	<small>normalsize words</small>
<code>{\large large words}</code>	<small>large words</small>
<code>{\Large Large words}</code>	<small>Large words</small>
<code>{\LARGE LARGE words}</code>	<small>LARGE words</small>
<code>{\huge huge words}</code>	<small>huge words</small>

# Lists

```
\documentclass{article}

\begin{document}

\begin{enumerate}
  \item First thing
  \item Second thing
  \begin{itemize}
    \item A sub-thing
    \item Another sub-thing
  \end{itemize}
  \item Third thing
\end{enumerate}

\end{document}
```

LaTeX offers two types of lists:

**enumerate** produces numbered lists and

**itemize** produces a bulleted list.

Each item in the list is defined by `\item` command.

To produce a numbered list, use:

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

For a bulleted list, use:

```
\begin{itemize}
\item Item for the first bullet
\item Item for the second bullet
\end{itemize}
```

List can be nested to produce sub-lists.

## More lists

```
\documentclass{article}

\begin{document}

\begin{itemize}
  \item[-] First thing
  \item[+] Second thing
  \begin{itemize}
    \item[Fish] A sub-thing
    \item[Sea] Another
sub-thing
  \end{itemize}
  \item[Q] Third thing
\end{itemize}

\end{document}
```

We can even change a bullet symbol with any other symbol or with even a word. To achieve that, use square brackets after the `\item` command and put whatever you want between them:

```
\begin{itemize}
\item[-] Minus instead of the bullet or
\item[bla] text instead of the bullet
\end{itemize}
```

List can be nested to produce sub-lists

# Special characters

```
\documentclass{article}
```

```
\begin{document}
```

% enter the commands to  
produce  
the following text:  
Item #1A\642 costs \$8 & is  
sold at a ~10% profit.

```
\end{document}
```

The following symbols are reserved characters which have a special meaning in LaTeX:

#   \$   %   ^   &   \_   {   }   ~   \

All of these apart from the backslash \ can be inserted as characters in your document by adding a prefix backslash:

\#   \\$   \%   \^{}   \&   \\_   \{   \}   \~{}

Note that you need to type a pair of curly brackets {} after the hat ^ and tilde ~, otherwise these will appear as accents over the following character. For example, “\^ e” produces “ê”.

The backslash character \ can not be entered by adding a prefix backslash, \\, as this is used for line breaking.

Use the \textbackslash command instead.



# Inserting references

```
@inproceedings{
  deja2016genre,
  author = Deja, Jordan Aiko and
  Blanquera, Kim and Carabeo, Carlo
  Eliczar and Copiaco, Jo Rupert,
  title = "Genre classification of
  opm songs through the use of musical
  features",
  booktitle= "Theory and Practice of
  Computation: Proceedings of Workshop
  on Computation: Theory and Practice
  WCTP2014",
  pages = "77--88",
  year = "2016",
  issn = "0933-3657"
}
```

LaTeX includes features that allow you to easily cite references and create bibliographies in your document. We will use a separate **BibTeX file** to store the details of our references.

BibTeX has the file extension *.bib* and you should name it and kept in the same folder as your *.tex* file.

The *.bib* file is plain text - it can be edited using Notepad or your LaTeX editor (e.g. TeXMaker).

Each reference in the BibTeX file should have the format as shown on the left.

# More about references

```
@article{
  GROZNIK2013,
  author = "Vida Groznik and Matej Guid
    and Aleksander Sadikov and Martin
    Mo\v{z}ina and Dejan Georgiev and
    Veronika Kragelj and Samo
    Ribari\v{c}
    and Zvezdan Pirto\v{s}ek and Ivan
    Bratko",
  title = "{E}licitation of
    {N}eurological
    {K}nowledge with {A}rgument-based
    {M}achine {L}earning",
  journal = "{A}rtificial
    {I}ntelligence
    in {M}edicine",
  volume = "57",
  number = "2",
  pages = "133 -- 144",
  year = "2013",
  issn = "0933-3657",
  doi = "https://doi.org/10.1016/j.
    artmed.2012.08.003"
}
```

Each reference starts with the **reference type**.

Reference types include:

`@article`,

`@book`,

`@incollection` for a chapter in an edited book and

`@inproceedings` for papers presented at conferences.

The reference type declaration is followed by a curly bracket, then the **citation key**. Each reference's citation key must be unique - you can use anything you want, but a system based on the first author's name and year (as in the example) is one of the easiest to keep track of.

The remaining lines contain the reference information in the Format:

`Field name = "field contents"`, or like this:

`Field name = {field contents},.`

# Inserting references

```
\documentclass{article}
\begin{document}
  This is some text which will be used as
  an example for the citation purpose.
  This method was introduced in our paper
  from 2013~\cite{GROZNIK2013}.
  \bibliographystyle{plain}
  \bibliography{doc1}
\end{document}
```

If you want to use your *.bib* file in the actual document to cite the reference stored in the *.bib* file, you have to use the following command at the end of the *.tex* file just before the `\end{document}`:

```
\bibliographystyle{plain}
\bibliography{Reference}
```

Where *Reference* is the name of your *.bib* file.

For citing a reference use the following command in your *.tex* file: `\cite{citationkey}`

If you don't want an in text citation, but still want the reference to appear in the bibliography, use `\nocite{citationkey}`.

To include a page number in the citation put it in square brackets before the citation key: `\cite[p. 215]{citationkey}`.

To cite multiple references include all the citation keys within the curly brackets separated by commas:

```
\cite{citation01,citation02,citation03}.
```

# Reference styles

## Numerical citations

**Plain** The citation is a number in square brackets (e.g. [1]). The bibliography is ordered alphabetically by first author surname. All of the authors' names are written in full.

**Abbrv** The same as plain except the authors' first names are abbreviated to an initial.

**Unsrtd** The same as plain except the references in the bibliography appear in the order that the citations appear in the document.

**Alpha** The same as plain except the citation is an alphanumeric abbreviation based on the author(s) surname(s) and year of publication, surrounded by square brackets (e.g. [Kop10]).

## Author-date citations

Use the **natbib** package if you want to include author-date citations.

Natbib uses the command `\citep{...}` command for a citation in brackets (e.g. [Koppe, 29 2010]) and `\citet{...}` for a citation where only the year is in brackets (e.g. Koppe [2010]).

Natbib comes with three bibliography styles: **plainnat**, formats the bibliography in the same way as the plain style, **abbrvnat** formats the bibliography in the same way as the abbrv style, **unsrtnat** formats the bibliography in the same way as the unsrtd style, respectively.

There are lots of other ways that you can modify citations when using the natbib package - see the package's reference sheet for full details.

## Practice Task - make memes - but with citations!

- Create a new file in Texmaker.
- Type your references in the correct format.
- Save the file with the same name as your *.tex* document (for example, Doc1) and save it as a BibTeX database in the same folder as your *.tex* file.
- Switch to your *.tex* document and insert `\cite`, `\bibliographystyle` and `\bibliography` commands in the relevant places.
- Typeset your *.tex* file.
- Switch to your *.bib* file, choose BibTeX from the typeset menu and click the Typeset button.
- Switch to your *.tex* file and typeset it twice. The in-text citations and reference list should be inserted.



Homework

$$\sum_{n=1}^{\infty} n = -\frac{1}{12}$$

Advertising

Reposts

$$\pi = e = 3$$

**“Let”**

Nonsensical proofs

Very elementary math

Disrespecting other academic disciplines



High quality OC  
related to mathematics

$$69 = \sum_{n=1}^9 \sum_{d|n} d$$

# Theoretical computer science:

27.5 Proposition.  $\vdash_{K+(A3)} \Box(A \leftrightarrow B) \rightarrow \Box(F(A) \leftrightarrow F(B))$ .

27.16 Lemma.  $w \models \Box(p \leftrightarrow A) \rightarrow \Box(\Box C_i(p) \rightarrow \Box C_i(H_i))$ .

# Also theoretical computer science:

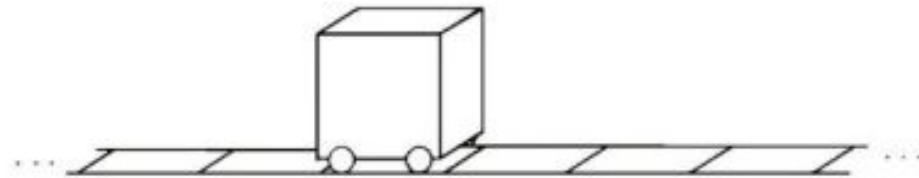


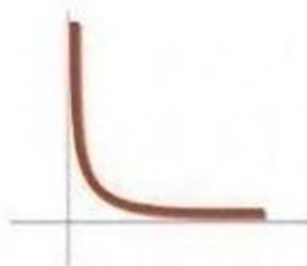
Figure 3-1. A Turing machine.

Appropriate for all ages

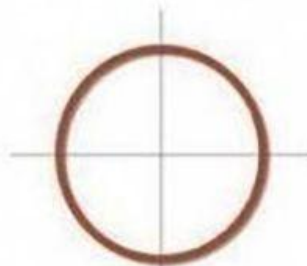


# ALL YOU NEED IS

$$y = \frac{1}{x}$$



$$x^2 + y^2 = 9$$



$$y = |-2x|$$



$$x = -3|\sin y|$$



Learning L<sup>A</sup>T<sub>E</sub>X  
so your reports  
are more nicely  
typeset



Learning L<sup>A</sup>T<sub>E</sub>X  
because your tutor  
marks down  
Word-users



Learning L<sup>A</sup>T<sub>E</sub>X  
for that smug  
sense of elitist  
superiority



Learning L<sup>A</sup>T<sub>E</sub>X  
so you can  
understand  
memes

