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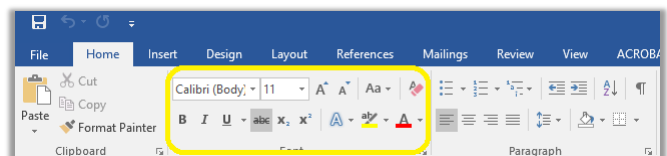# Introduction to LaTeX

Text formatting

Contents

- Emphasizing text
- Fonts etc.
- Punctuation
- Symbols etc.
- Verbatim

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Critical note

- **Do not use these LaTeX commands**
  http://www.maths.adelaide.edu.au/anthony.roberts/LaTeX/ltxbanned.php

Do not use these LaTeX commands

The following commands are physical commands. Avoid at all costs. Every use of one of these LaTeX commands within a document is a failure to use proper logical LaTeX (you know who you are). Instead, think why you want the effect, and then code the logical reason, not the physical command.

- \\ (except inside a special environment like tabular, array, or verse)
- \textbf or \bf (usually need \vec or sectioning like \paragraph)

- \texttt or \tt (usually need a verbatim environment, or \url command)
- \textit or \it (use \emph)
- \textsf or \sf
- \mathrm or \rm (use \operatorname{} for math symbol, or \text{} for English)
- \mathscr (as it is hard for a reader to distinguish between I, J and T, and between C and O---use \mathcal instead)

- \tag (except where absolutely necessary, and even then take a cold shower before deciding)
- \eqno
- \dfrac
- \displaystyle
- \hspace
- \vspace
- \limits
- \noindent

- \newpage
- \clearpage
- \linebreak
- \pagebreak

If you 'know' that what you need involves one of these commands, then define a logical new command in a style file. The new command implements the physical appearance you desire, but within your document you only invoke the logical command.
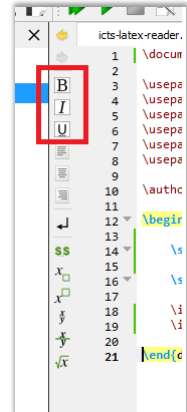
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Highlighting text concepts

- Highlight important concepts in your text:
  - Italics
  - Bold
  - Underlined
  - Emphasis

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Emphasizing text

- Use the Menu bar from your editor
- Use command:
  - Italic: `\textit`
  - Bold: `\textbf`
  - Underlining: `\underline`
- Emphasis
  - Emphasized: `\emph`
  - By default *\emph* command behaves like *\textit*, but is context dependent (nesting)
- *File:demo_emphasize_text.tex*

Highlighting text

- Package: soul (+ color)

`\hl{this is highlighted text}. More text. Can I change the color?`

- *File: demo_highlight_text_soul.tex*

> This is some text
> this is highlighted text. More text. Can I change the color?

- Package: ulem
- Allows for various types of underlining
- *File: demo_ulem.tex*

> ~~Diesel~~, solar power to the top
> ~~Diesel~~, solar power to the top
> <u>Diesel</u>, solar power to the top
> <u>Diesel</u>, solar power to the top

Hands-on

- `\emph{text}`: *emphasized text*
- `\underline{text}`: underlined text
- Change the font style:
  - `\textbf{text}`:**bold**:
  - `\textit{text}`:*italic*:
- *File: demo_fontstyle.tex*

document font family
emphasis
roman font family
sans serif font family
`typewriter font family`
upright shape
italic shape
slanted shape
SMALL CAPITALS
bold

Font size

- The default text size is controlled by the document class. The standard font size is 10pt.
- Can be adjusted by using the size switch command:
  - `\Huge`
  - `\huge`
  - `\LARGE`
  - `\large`
  - `\normalsize`
  - `\small`
  - `\footnotesize`
  - `\scriptsize`
  - `\tiny`

Font size

- Font size commands can be used as:
  - Switch
  - Environment
- *File: demo_fontsize.tex*

Font size

	10pt	11pt	12pt
\tiny	5	6	6
\scriptsize	7	8	8
\footnotesize	8	9	10
\small	9	10	11
\normalsize	10	11	12
\large	12	12	14
\Large	14	14	18
\LARGE	18	18	20
\huge	20	20	25
\Huge	25	25	25

https://tex.stackexchange.com/questions/24599/what-point-pt-font-size-are-large-etc

Font size

```
\begin{document}
This is in normal text, while these words are in
   {\small small text}.

Or, if you wanted to put a larger region in a
   different size, you'd use
something like:

   \begin{small}
   this will all be in small text
   this too.
   etc..
   \end{small}

   \begin{Huge}
   this will all be in Huge text
   this too.
   etc..
   \end{Huge}

   \begin{huge}
   this will all be in huge text
   this too.
   etc..
   \end{huge}
\end{document}
```

This is in normal text, while these words are in small text.
Or, if you wanted to put a larger region in a different size, you'd use something like:
this will all be in small text this too. etc..

this will all be in Huge text this too. etc..
this will all be in huge text this too. etc..

Fonts

- LaTeX's default font is Computer Modern
- Fonts for text have five main attributes: encoding, family, series, shape, size
- Several *variations* of a font can be used in a document
  - Family
    - Serif (roman) (default)
    - Sans serif
    - Typewriter (monospaced)
  - Series
    - Medium (default)
    - Boldface
  - Shape
    - Upright (default)
    - *Italic*
    - Slanted
    - Caps & small caps
- *File: demo_font_variations_short*
- *File: demo_font_variations*

Fonts

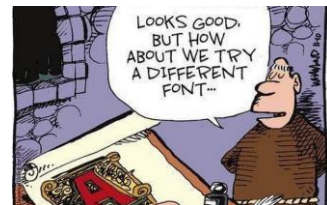- Types of fonts in LATEX are classified into four categories: *family*, *series*, *shape* and *size*.

		Command	Declaration
Family	Serif (roman) (default)	\textrm{}	\rmfamily
	Sans serif	\textsf{}	\sffamily
	Typewriter (monospaced)	\texttt{}	\ttfamily
Series	Medium series (default)	\textmd{}	\mdseries
	Boldface	\textbf{}	\bfseries
		Command	**Declaration**
Shape	Upright shape (default)	\textup{}	\upshape
	Italic shape	\textit{}	\itshape
	Slanted shape	\textsl{}	\slshape
	Caps & small caps shape	\textsc{}	\scshape
Size	Tiny	\tiny	
	Script	\scriptsize	
	…		

Fonts

- Font formatting can be obtained in different ways

1. **Commands**: A command marks exactly the text that is in between the curly brackets. A new paragraph cannot be started within a command.
   ```
   \textbf{ text }
   ```

2. **Environments**: Use the declaration command in an environment. An environment marks the text inside the environment.
   ```
   \begin{bfseries}
       text
   \end{bfseries}
   ```

3. **Switch**: declaration can also be used as a switch. The following text appears in the respective font formatting (probably until the end of the environment, unless other font formatting commands/environments/switches are used. The scope of a switch can be restricted by { }
   ```
   {\bfseries    text}
   ```

Fonts

- The default font for LaTeX is Computer Modern
- You can't just use any font you have installed on your computer, you need special LaTeX fonts.
- The easy way to use other fonts is to use an existing package,
  - `\usepackage{avant}`
  - the whole document will be in that font
  - Check https://tug.org/FontCatalogue/
- *File: demo_changefont.tex*

Fonts

- Change the font for part of the text (not advisable)
- To select a font, use:
  - `\fontfamily{<familyname>}\selectfont`
  - restrict the scope of font changing commands by enclosing the text in braces:
  - `{\fontfamily{<familyname>}\selectfont ...}`
  - It is important to know the font familyname!
- *File: demo_font_partly_changed.tex*
- https://tex.stackexchange.com/questions/25249/how-do-i-use-a-particular-font-for-a-small-section-of-text-in-my-document

Fonts

- Another approach in setting the default font
- `\renewcommand{\sfdefault}{phv}`
- This sets the default sans font (`\sfdefault`) to the phv family, `phv` is the internal name of the font (Helvetica)
- *File: demo_renewcommand_default*

Font	fontpackagename	fontcode
Computer Modern Roman		cmr
Latin Modern Roman	lmodern	lmr
Latin Modern Dunhill	lmodern	lmdh
TEX Gyre Termes	tgtermes	qtm
TEX Gyre Pagella	tgpagella	qpl
TEX Gyre Bonum	tgbonum	qbk
TEX Gyre Schola	tgschola	qcs
Times	mathptmx	ptm
Utopia / Fourier	utopia / fourier	put
Palatino	palatino	ppl
Bookman	bookman	pbk
Charter	charter	bch
Computer Modern Sans Serif		cmss
Latin Modern Sans Serif	lmodern	lmss
TEX Gyre Adventor	tgadventor	qag
TEX Gyre Heros	tgheros	qhv
Helvetica	helvet	phv
Computer Modern Typewriter		cmtt
Latin Modern Sans Typewriter	lmodern	lmtt
TEX Gyre Cursor	tgcursor	qcr

Fonts
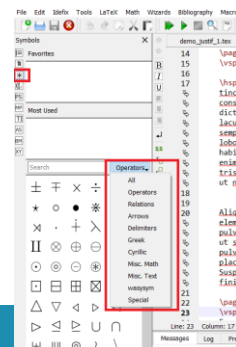
- https://www.overleaf.com/learn/latex/Font_sizes,_families,_and_styles
- https://www.overleaf.com/learn/latex/Font_typefaces
- https://en.wikibooks.org/wiki/LaTeX/Fonts

Symbols, accents, language, etc.

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Symbol?

- Have a look at *The Comprehensive LaTeX Symbol List*
  http://tug.ctan.org/info/symbols/comprehensive/symbols-a4.pdf
- This document lists >14000 symbols and the corresponding LaTeX commands that produce them.
- Detexify: http://detexify.kirelabs.org/classify.html
- Check your LaTeX editor (i.e. TeXstudio)
  - Wizard > Math Assistant

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Accents and symbols

- There are 5 common accents: ÒÓÔÕÖ

```
\`O
\'O
\^O
\~O
\"O
```

- Some symbols have a special meaning within LaTeX, put a **** in front of $ % { _ # & } \\

```
\$
\%
\{
\_
\#
\&
\}
\textbackslash
```

- Check also the *Comprehensive LaTeX Symbol List*

International language support: problems

- LaTeX has its roots in USA
- Input of é, è, ë, …from the keyboard?
- Typing 'macro-accents':
  - it can become cumbersome if you type a lot of accented characters.
  - the spell checker will not work on such words,
- https://www.overleaf.com/learn/latex/International_language_support
- https://tex.stackexchange.com/questions/44694/fontenc-vs-inputenc
- https://en.wikibooks.org/wiki/LaTeX/Internationalization

International language support

- By default, LaTeX works with ASCII characters
- Input letters of national alphabets directly from the keyboard.
- Use `inputenc` package to set up input encoding.
  - `\usepackage[encoding]{inputenc}`
  - recommended input encoding is `utf8`
  - enables direct entering of accented characters and symbols from code tables other than ASCII, and of Unicode.

International language support

- When TeX and LaTeX were introduced, fonts did not contain glyphs for accented characters. They were printed as two characters, one being the actual accent. It also interfered with hyphenation.
- The fontenc package in LaTeX is used to specify the font encoding for the document. Font encoding determines how characters are represented and stored in the output document. It is crucial when dealing with non-ASCII characters, such as accented letters, mathematical symbols, and special characters.
- In LaTeX, the default font encoding is called "OT1" (Old Text Encoding), supporting only 7-bit characters, which means that some characters may not be available or may not display correctly.
- For proper document generation, choose a font which has to support specific characters for a given language by using fontenc package：
  - `\usepackage[encoding]{fontenc}`
  - recommended input encoding is `T1`
- *File: demo_inputenc.tex*

babel

- Translates some elements within the document,
- Activates the appropriate hyphenation rules for the language you choose.
- Activate the package by adding the next command to the preamble:
  - `\usepackage[language]{babel}`
    - `\usepackage[dutch]{babel}`
- *File: demo_babel.tex*
- https://en.wikibooks.org/wiki/LaTeX/Internationalization

Hands-on

- Type some text and use the commonly used accents in some of the words
- *demo_accentsymbol.tex
  demo_accents.tex*

Extra

Preformatted text

- Use the `verbatim` environment to typeset exactly as given in a monospaced font, with no command interpretation.
- To include a non-interpreted string within your text, use `\verb|the text|` command.
  You may use |, +,=, etc. to start and end the text (the same symbol must be used to start and end the text).
- *File: demo_verbatim.tex*
- The verbatim environment can be extended to use normal commands: alltt package.

Hyphens and dashes etc.

- hyphens (-), en dashes (–), em dashes (—), minus signs (-) serve different purposes
- *File: demo_hyphen_dash.tex*

> For an ordinary hyphen use - I want a five-dollar bill for paying my near-field-effect tracker.
> For a range of numbers use the en dash "–" as in 2–8 (named because it is as wide as n).
> To indicate a parenthetic expression use the em dash "—" (as wide as m). Some punctuation — like parethesis and commas — play an important role.
> For the minus sign use −100 (that is, a hyphen in math mode).

- Ellipsis
  - Spacing might go wrong when typing …
  - Use \ldots

Overfull / Underfull box

- **overfull hbox**: LaTeX always tries to produce the best line breaks possible. If it cannot find a way to break the lines in a manner that meets its high standards, it lets one line stick out on the right of the paragraph.
- Happens most often when:
  - A suitable place to hyphenate a word is not found.
  - Verbatim
- Tip: use option draft in documentclass (black square explicitly shown)
- Instruct LaTeX to lower its standards
  - \sloppy increases the inter-word spacing, usually resulting in a warning ("underfull hbox")
  - \fussy brings LaTeX back to its default behavior.
  - *File: demo_sloppyfussy.tex*

hyphenation

- Direct the hyphenation yourself
  - `\hyphenation{FORTRAN Hy-phen-a-tion}`
  - each hyphenation point is indicated
  - in the preamble
- Inline words: `\-` indicates hyphenation points allowed in the word.
  - is especially useful for words containing special characters
  - `su\-per\-cal\-i\-frag\-i\-lis\-tic\-ex\-pi\-al\-i\-do\-cious`
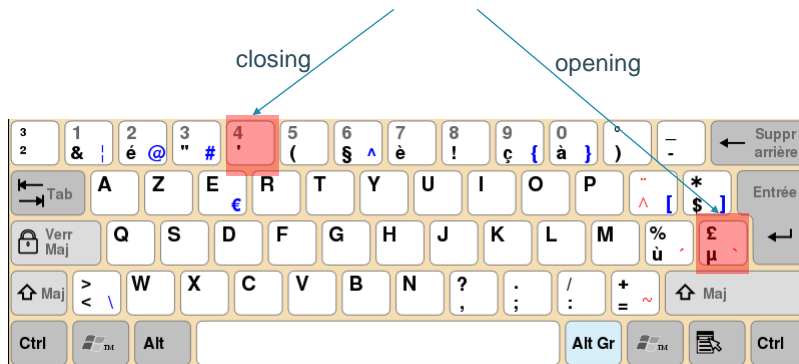- *File: demo_hyphenate.tex*

Quotation marks

- LaTeX does not automatically convert "straight" quotes into correctly-facing "curly" quotes
- do *not* use the "
  - Opening: use two ` (accent grave)
  - Closing: use two ' (vertical quote) for closing quotation marks.
  - For single quotes you use just one of each.
- *File: demo_quote_marks.tex*
- https://tex.stackexchange.com/questions/113363/smart-quote-in-texstudio
- https://www.overleaf.com/learn/latex/Typesetting_quotations

Quotation marks

- Options->Configure TexStudio -> Editor ->Replace Double Quotes

closing   opening

Hands-on

- Generate some text, and try to explicitely print some LaTeX commands
- Use the `\verb` command
- Use the `verbatim` environment
- *handson_verbatim.tex*