

Session 1. Why T_EX and first doc

Digital Skills for Research
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1 What's T_EX

T_EX is a typesetting language. It makes text look good on the page.

A *.tex file is a plain text file which contains text with explicit formatting commands (e.g. `\textbf`). WYSIWYM (what you see is what you mean) concept.

The *.tex file has to be run by a compiler to produce formatted version.

It is required by many publishing venues, makes inputting mathematics, bibliographies and cross-referencing easier, ensures consistency across sections.

T_EX can broadly refer to any of the related components:

Distributions coherent collections of TeX-related software, e.g. MiKTeX, TeXLive, MacTeX

Text editors IDE, software to create and edit plain text documents, generic (notepad, gedit, nano, vim) or specialised (TeXStudio, Texmaker, inc. online editors such as Overleaf)

Compilers executable binaries, which are run on *.tex to produce formatted output (a PDF file), e.g. pdflatex (can be run in terminal: `pdflatex main.tex`)

Formats TeX-based languages in a verbatim environment which can break lines which one actually writes documents, e.g. LaTeX, plain TeX

Packages add-ons to the basic TeX system, developed independently, providing additional typesetting features (e.g. fonts); stored in CTAN network

Examples of complete desktop systems:

- MikTeX + Texmaker for Windows (HowTo)
- TeXLive + TeXStudio for Linux (`sudo apt install texlive & sudo apt install texstudio`)
- MacTeX for MacOSX

2 Online solution: Overleaf account and project

Go to Overleaf, register an account and start a blank project. Boom! It comes with some basic predefined structure!

A brief Overleaf tour:

- Recompile often!!!
- Account and project folders
- Sharing and Review
- Main .tex
- Notice GitHub and Mendeley Integration
- [Open an example in Overleaf](#)
- Upload .zip and Download PDF/zip

3 First document: layout and structure

a verbatim environment which can break lines A .tex consists of

- *preamble*: imported styles and packages, defined functions
- *main code* (inside `\begin{document} ... \end{document}`) with textual content, math, pics, tables interspersed with formatting commands, inc. environment
- *commented content*: use % to comment out lines and CTRL + T to toggle comment/uncomment selected lines

3.1 Moving text around

Copy-paste this text above and try out basic behaviour and commands:

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

- *Blank line* is a new paragraph separator, which affects the behaviour of space-managing commands. Or use `\.`
- Insert customised vertical or horizontal space with *commands*:
 - a) `\vspace{.5cm}`, `\hspace{1em}`, `\vfill`
 - b) `\bigskip`, `\medskip`
- New paragraphs are indented by default. Add `\setlength\parindent{0pt}` to *preamble* to lose indentation
- Use `\newpage` command to force a new page
- centering with a command `\centering` or an environment `\begin{center}`
- Use *environments* to create ragged right/left text (e.g. `\begin{flushright} ... \end{flushright}`)

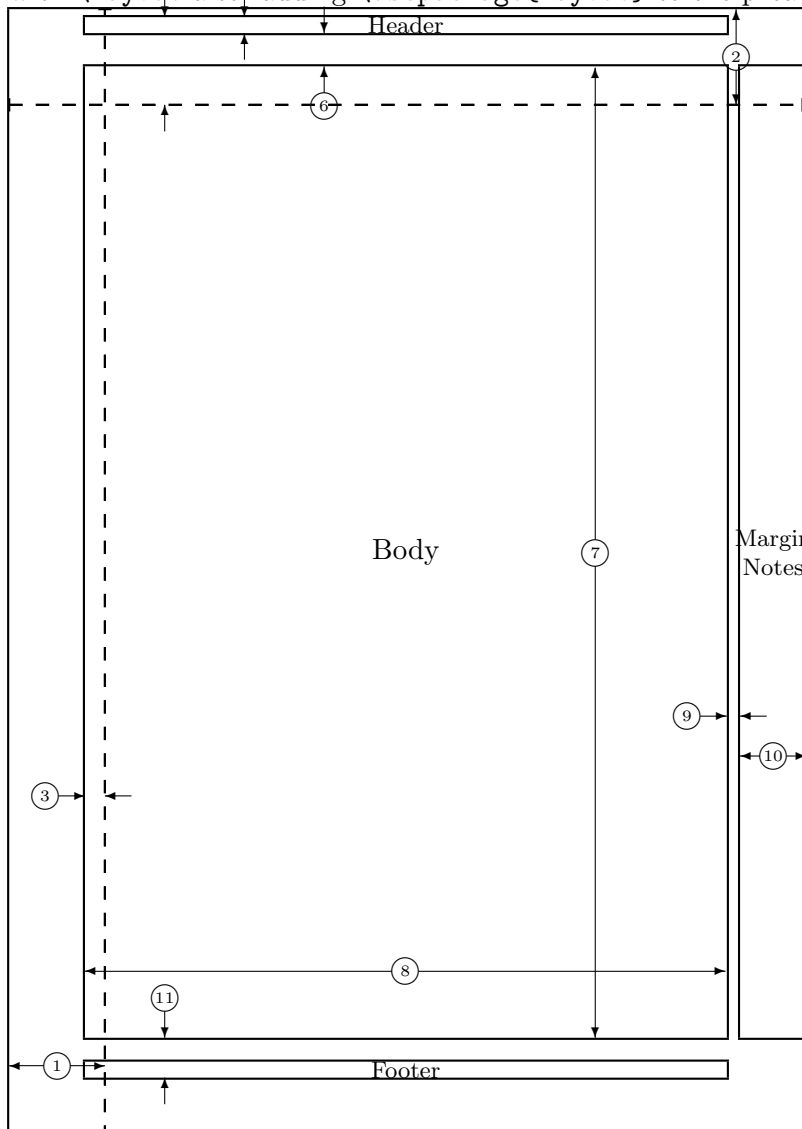
3.2 Adding structural elements

1. `frontmatter` (inc. `\title{}`, `\author{}`, `\date{}`) is defined in preamble and called with `\maketitle`
2. `\section{First Section}\label{sec:one}`, `\subsection{Your subtitle}`
3. `\begin{abstract} ... \end{abstract}`
4. `\tableofcontents`
5. `\footnote[**]{your text in foot}`

3.3 Layout

Default L^AT_EX layout

with `\layout` after adding `\usepackage{layout}` to the preamble



- | | | | |
|----|-------------------------------------|----|---|
| 1 | one inch + <code>\hoffset</code> | 2 | one inch + <code>\voffset</code> |
| 3 | <code>\oddsidemargin = -15pt</code> | 4 | <code>\topmargin = -66pt</code> |
| 5 | <code>\headheight = 12pt</code> | 6 | <code>\headsep = 25pt</code> |
| 7 | <code>\textheight = 731pt</code> | 8 | <code>\textwidth = 483pt</code> |
| 9 | <code>\marginparsep = 10pt</code> | 10 | <code>\marginparwidth = 50pt</code> |
| 11 | <code>\footskip = 30pt</code> | | <code>\marginparpush = 5pt</code> (not shown) |
| | <code>\hoffset = 0pt</code> | | <code>\voffset = 0pt</code> |
| | <code>\paperwidth = 597pt</code> | | <code>\paperheight = 845pt</code> |

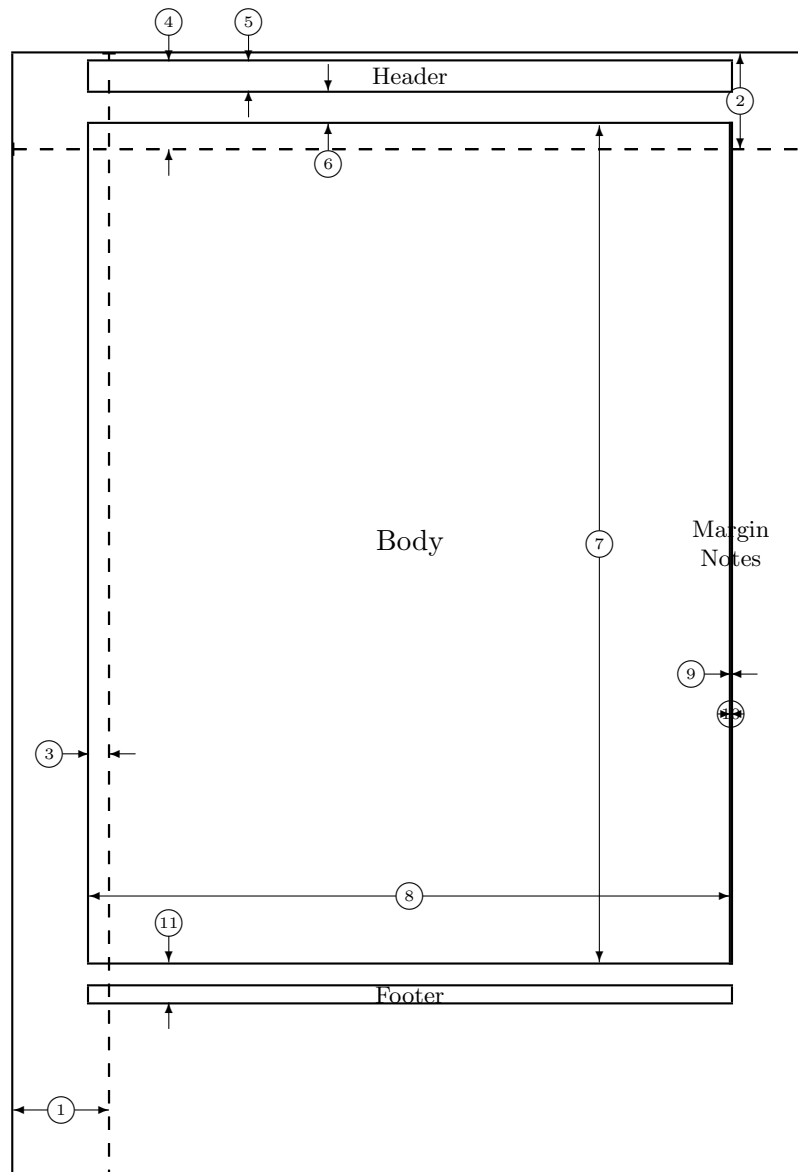
Setting the page size in preamble with:

```
\usepackage{geometry}
\geometry{
a4paper ,
total={170mm,257mm} ,
left=20mm,
top=15mm,
}
```

Customised L^AT_EX layout (no space for margin notes, bigger header, bigger bottom)

achieved with:

```
\setlength{\headheight}{22pt}
\setlength{\marginparwidth}{0pt}
\setlength{\marginparsep}{0pt}
\setlength{\textheight}{631pt}
```



- | | | | |
|----|------------------------|----|----------------------------------|
| 1 | one inch + \hoffset | 2 | one inch + \voffset |
| 3 | \oddsidemargin = -15pt | 4 | \topmargin = -66pt |
| 5 | \headheight = 22pt | 6 | \headsep = 25pt |
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| | \hoffset = 0pt | | \voffset = 0pt |
| | \paperwidth = 597pt | | \paperheight = 845pt |

Assignment 1

- Get the software: select and install a LaTeX distribution and an editor (see discussion on page 1)
- Create locally a two-page document with a typical research paper structure and symmetric margins (top 2cm, left 2cm);
- Use various elements of structure: table-of-contents, a footnote, columns, additional space
- Zip the project, upload it to Overleaf and share with m.kunilovskaia@wlv.ac.uk