Introduction to XeLaTeX

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What is XeLaTeX?

- it is a mark-up language for typesetting and text writing (and more)
- it is a variant of the LaTeX format that introduced full Unicode support and `.ttf`, `.otf` font handling
- it is implemented by the XeTeX engine, that is derived from the TeX system

How does it work?

- put the XeLaTeX code in a `.tex` with the content of your document
- the XeTeX engine reads and typeset the code
- a `.pdf` file with your document is produced

Get it!

- a *distro* contains both the systems and the engines, plus software that ease the typesetting process
- **any problems or questions?**

Document class

```
1 \documentclass{article}
2
3 \begin{document}
4
5 Hello, World!
6
7 \end{document}
```

Title

```
1  \documentclass{article}
2
3  \title{Introduction to science}
4  \author{John Smith}
5  \date{}
6
7  \begin{document}
8  \maketitle
9
10 Hello, World!
11
12 \end{document}
```

Headings

```
1  \documentclass[12pt,a4paper]{article}
2
3  \title{Introduction to science}
4  \author{John Smith}
5  \date{}
6
7  \begin{document}
8  \maketitle
9  \tableofcontents
10
11 \section{Introduction}
12 Hello, World!
13
14 \subsection{Background}
15 Text...
16
17 \end{document}
```

Packages

Put the following code in the **preamble** (just after `\documentclass`):

```
1 \usepackage{fontspec}
2   \setmainfont{Times New Roman}
3 \usepackage{polyglossia}
4   \setmainlanguage{english}
```

Text layout

For a new paragraph, leave an empty line.
This is the new paragraph. You can *format* your **text**.
For a footnote.[1]

[1] This is a footnote.

Text layout

```
1 For a new paragraph, leave an empty line.
2
3 This is the new paragraph.
4 You can \textit{format} your \textbf{text}.
5
6 For a footnote.\footnote{This is a footnote.}
7
8 % This is a comment (it will not be typeset)
```

Bullet and numbered lists

```
1 \begin{itemize}
2 \item List: one, two
3 \item another point
4 \item yet another
5 \end{itemize}
```

Bullet and numbered lists

- List: one, two
- another point
- yet another

Bullet and numbered lists

```
1 \begin{itemize}
2 \item List: one, two
3 \item another point
4   \begin{enumerate}
5   \item three
6   \item four
7   \end{enumerate}
8 \end{itemize}
```

Bullet and numbered lists

- List: one, two
- another list
  1. three
  2. four

Figures

In your preamble put:

```
1 \usepackage{graphicx}
```

In your document environment put:

```
1 \begin{figure}
2 \centering
3 \includegraphics[width=0.6\textwidth]{
  mandarin_duck}
4 \caption{Mandarin duck.}
5 \end{figure}
```

Figures

Figure 1: Mandarin duck.

Tables

In your preamble, load `ctable`:

```
\usepackage{ctable}
```

In your document, insert:

```
\ctable[caption=Gender distribution,
pos=t
]{lcc}{}{
\FL
 & Male & Female \ML
Young & 85 & 65 \NN
Old & 100 & 147 \LL
}
```

Tables

Table 1: Genders

	Male	Female
Young	85	65
Old	100	147

Escape character

Reserved characters must be **escaped** with the escape characters, which is the backslash \.

`\&`	&
`\%`	%
`\#`	#
`\_`	_
`\textbackslash`	\

Maths

The formula can be reduced to $\int_0^\infty \mathrm{e}^{-x}\,\mathrm{d}x$.

$$\cos(2\theta) = \cos^2\theta - \sin^2\theta \tag{1}$$

$$\sqrt[n]{1 + x + x^2 + x^3 + \ldots} \tag{2}$$

$$\sum_{i=1}^{10} t_i \tag{3}$$

Maths

```
1  I love Maths! $\int_0^\infty \mathrm{e}^{-x}\,\mathrm{d}
   x$.
2
3  \begin{equation}
4      \cos (2\theta) = \cos^2 \theta - \sin^2 \theta
5  \end{equation}
6
7  \begin{equation}
8      \sqrt[n]{1+x+x^2+x^3+\ldots}
9  \end{equation}
10
11 \begin{equation}
12     \sum_{i=1}^{10} t_i
13 \end{equation}
```

Cross-referencing

- use `\label{...}` to index headings, tables, images, etc. Put the lable within { }
- reference them using `\ref{...}`
- check the package `cleveref` for advanced cross-referencing

Cross-referencing

```
1 \section{Methodology}
2 \label{sec:method}
3 You can cross-ref almost anything: headings,
  figures, tables, equations...
4
5 \section{Conclusions}
6 As I said in section \ref{sec:method}... In
  equation \ref{fig:duck}...
```

Cross-referencing

```
1 \begin{figure}
2     \includegraphics{image}
3     \caption{My fancy image.}
4     \label{fig:image}
5 \end{figure}
6
7 As you can see in Figure \ref{fig:image} [...]
```

Cross-referencing

```
1 \ctable[caption = My useless table,
2 label = tab:table
3 ]{cc}{}{
4 \FL
5 This is just & a useless table \LL
6 }
7
8 As you can see in Table \ref{tab:table} [...]
```

Code listings

```
1  rangelist = range(10)
2  print rangelist
3  [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
4  for number in rangelist:
5      if number in (3, 4, 7, 9):
6          break
7      else:
8          continue
9  # Comment
10 if rangelist[1] == 2:
11     print "The second item is 2"
12 else:
13     print "Dunno"
```

Code listings

```
1 \lstset{keywordstyle=\bfseries\color{green!40!
  black},commentstyle=\itshape\color{purple!40!
  black},identifierstyle=\color{blue},
  stringstyle=\color{red},showstringspaces=false
  ,}
2
3 \begin{lslisting}
4 [your code]
5 \end{lslisting}
6
7 \lstinputlisting[language=Python]{
  source_filename.py}
```

Modular documents

- file structure of your document
- modularity is good for theses/dissertations
- Project folder
  - `main.tex`: it's the main document that you compile
  - `tex`: is the folder where you put the `.tex` subfiles
  - `img`: is the folder where you put the images

Modular documents

```
1  \documentclass{memoir}
2
3  \usepackage{graphicx}
4      \graphicspath{{./img/}} % set the folder
       with images
5  \usepackage{...} % load your packages as usual
6
7  \begin{document}
8
9  \input{./tex/introduction.tex}
10 \input{./tex/methods.tex}
11
12 \end{document}
```

Resources

- LaTeX Wikibook:
  `https://en.wikibooks.org/wiki/LaTeX`
- TeX StackExchange:
  `http://tex.stackexchange.com`
- Comprehensive TEX Archive Network (CTAN):
  `http://www.ctan.org`
- `memoir` class: `http://www.ctan.org/tex-archive/macros/latex/contrib/memoir/`
- For stats: Sweave (LaTeX + R)
  `http://www.statistik.lmu.de/~leisch/Sweave/`
- versioning system: git + TEX
  `http://stackoverflow.com/a/6190412/2804314`