Introduction to LaTeX

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What is LaTeX? [1]

- It is a macro package based on TeX [2].
- Its purpose is to simplify TeX typesetting,
  especially for documents containing mathematical formulae.
- Its document processing is essentially programming:
  you create a text file in LaTeX markup and
  the LaTeX compiler reads this in order to produce the final document.
- It is widely used in academia.

A First Document in LaTeX: Source Code

```
\documentclass[12pt]{article}
\usepackage[british]{babel}

\newcommand{\Editor}{\textbf{Emacs}} % define macros!

\title{A Sample \LaTeX\ Report} % used by \maketitle
\author{Pierre Flener} % used by \maketitle
\date{\today} % used by \maketitle

\begin{document}

\maketitle % generates the title page

\section{Revisiting $n$-Queens}
I typed this file with a plain-text editor.
(I used \Editor.)

\end{document}
```

A First Document in LaTeX: Result of Compilation

A Sample LaTeX Report

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1 Revisiting n-Queens

I typed this file with a plain-text editor. (I used **Emacs**.)

A Table in LaTeX: Source Code (from the Demo Report)

```
\begin{tabular}{rrrrrrrrrrrrr} % right [r] for decimal-point alignment
  \input{res-M4CO.tex}
\end{tabular}
```

The Output of our `run_backends` Script is in LaTeX

Direct the output of our `run_backends` experiment script into the mentioned included file `res-M4CO.tex`:

```
Backend & \multicolumn{2}{c}{Chuffed} & \multicolumn{2}{c}{CP-SAT} & \multicolu
\cmidrule(lr){2-3} \cmidrule(lr){4-5} \cmidrule(lr){6-7} \cmidrule(lr){8-9} \cm
\texttt{n} & \texttt{obj} & time & \texttt{obj} & time & \texttt{obj} & time &
\midrule
$3$ & \textbf{20} & \textbf{1} & \textbf{20} & 585 & \textbf{20} & 606 & \textb
$4$ & \textbf{34} & \textbf{180} & \textbf{34} & 696 & \textbf{34} & 646 & \tex
$5$ & \textbf{26} & 381910 & \textbf{26} & \textbf{2594} & \textbf{26} & 47128
$6$ & - & t/o & 27 & t/o & - & t/o & \textbf{26} & \textbf{296077} & 28 & t/o &
```

Automatically formatting output is very useful when one runs experiments several times.

Hint: Always use a script to run experiments!

A Table in LaTeX: Result of Compilation

Backend	Chuffed		CP-SAT		Gecode		Gurobi		PicatSAT		Yuck	
n	obj	time	obj	time	obj	time	obj	time	obj	time	obj	time
3	**20**	**1**	**20**	585	**20**	606	**20**	684	**20**	693	**20**	t/o
4	**34**	**180**	**34**	696	**34**	646	**34**	1123	**34**	764	**34**	t/o
5	**26**	381910	**26**	**2594**	**26**	47128	**26**	65629	**26**	t/o	**26**	t/o
6	–	t/o	27	t/o	–	t/o	**26**	**296077**	28	t/o	**26**	t/o

Skeleton Reports

- The course website has LaTeX source files with the imposed structure for the assignment reports and project report, and with indications on how to proceed.
  Use them! This saves your time and our time.
  The demo report exemplifies the expected quality of content.
- Our `run_backends` script conducts the experiments and generates a result table that is automatically imported (rather than manually copied) into your LaTeX report, so each time you change the model, it suffices to re-run that script and re-compile your report, without any tedious number copying!
- You focus on the **content** in order to generate a professional-looking document **without** thinking about the formatting.
- We will **not** accept reports spread over multiple PDF files:
  write into separate files and use `\input{filename}`.
- You can share-edit using Overleaf.

Online Resources

- Download LaTeX: https://www.latex-project.org/get
- General help: https://en.wikibooks.org/wiki/LaTeX
- Detexify: LaTeX handwritten symbol recognition
  https://detexify.kirelabs.org/classify.html
- Two of the best websites to find answers to LaTeX questions are
  https://tex.stackexchange.com and
  https://stackoverflow.com/questions
- Share editing: https://www.overleaf.com

References

[1] LaTeX. LaTeX. https://en.wikipedia.org/wiki/LaTeX.

[2] TeX. TeX. https://en.wikipedia.org/wiki/TeX.

Questions?