# Introduction to LaTeX

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# What is TEX? [2]

- Low-level markup and programming language.
- Used to typeset documents attractively and consistently.
- Known for being extremely stable.
- Known for running under many operating systems.
- Nobody uses plain TEX: instead, distributions are used [1].


# What is LaTeX? [1]

- It is a macro package based on TeX.
- Its purpose is to simplify TeX typesetting, especially for documents containing mathematical formulae.
- LaTeX 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.

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# A First Document

```
\documentclass[12pt]{article}
\newcommand{\Editor}{\textbf{emacs}} % define macros!

\title{A Sample \LaTeX\ Report} % used by \maketitle
\author{Gustav Bj\"ordal} % 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}
```

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# A First Document: Result of Compilation

A Sample LaTeX Report

Gustav Björdal

September 3, 2018

## 1 Revisiting $n$-Queens

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

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# A Table in LaTeX (from the Demo Report)

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

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# The `run-solvers.sh` Output is in LaTeX

Direct the output of the `run-solvers.sh` script into the mentioned included file `res-M4CO.tex` and boldface the best results per row:

```
Backend & \multicolumn{2}{c}{Gecode} & \multicolumn{2}{c
\cmidrule(lr){2-3} \cmidrule(lr){4-5} \cmidrule(lr){6-7}
\texttt{n} & \texttt{obj} & time & \texttt{obj} & time &
\midrule
$3$ & $\mathbf{20}$ & $\mathbf{422}$ & $\mathbf{20}$ & $
$4$ & $\mathbf{34}$ & $\mathbf{372}$ & $\mathbf{34}$ & $
$5$ & $\mathbf{26}$ & $68100$ & $\mathbf{26}$ & t/o & $\
$6$ & -- & t/o & -- & t/o & $\mathbf{26}$ & $\mathbf{6568
```

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

HINT: Always use a script to run experiments!

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# A Table in LaTeX: Result of Compilation

| Backend | | Gecode | | Chuffed | | Gurobi | | fzn-oscar |
|---|---|---|---|---|---|---|---|---|
| | n | obj | time | obj | time | obj | time | obj |
| | 3 | **20** | **422** | **20** | 954 | **20** | 1268 | **20** |
| | 4 | **34** | **372** | **34** | 680 | **34** | 1210 | **34** |
| | 5 | **26** | 68100 | **26** | t/o | **26** | **46645** | 36 |
| | 6 | – | t/o | – | t/o | **26** | **65681** | – |

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# The Demo Report

- The course website has LaTeX source files with the imposed structure for assignment and project reports. USE THEM! They save your and our time.
- You fill in the blanks to generate a nice-looking report.
- Write scripts in order to format your results automatically into a file that is imported in your report.
- We will **not** accept reports spread over multiple PDF files: write into separate files and use `\input{filename}`.
- You can share-edit using Overleaf.

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# Online Resources

- Download LaTeX: https://www.latex-project.org/get
- General help: https://en.wikibooks.org/wiki/LaTeX
- Detexify: LaTeX handwritten symbol recognition http://detexify.kirelabs.org/classify.html
- Two of the best websites to find the answers to LaTeX questions are https://tex.stackexchange.com and https://stackoverflow.com/questions
- Share editing: https://www.overleaf.com
- Demo-report source files: http://user.it.uu.se/~pierref/courses/COCP/demoReport


# References


LaTeX.
https://en.wikipedia.org/wiki/LaTeX.


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# Questions?