Introduction to LaTeX

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About me

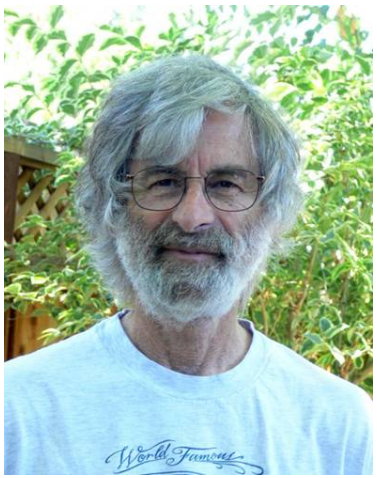
Veronika Heimsbakk , developer at ACANDO

- Done with my studies at Department of informatics by the spring of 2015.
- I love LaTeX, TikZ, colors and typography.
- Former employee at Sonen ♡.
- Favorites at Uni: INF2080 and INF2220.

LaTeX

- A document markup language.
- Released in 1984.
- LaTeX is short for **Lamport TeX**.

Leslie Lamport



- Recieved the ACM Turing Award in 2013 for his work with distributed systems.

TeX

TeX

- Released in 1978 by Donald Knuth.
- Typesetting system.
- Developed such that anyone could write high quality books at whatever computer.
- `https://www.tug.org/texlive/devsrc/Build/source/texk/web2c/tex.web`

Donald Knuth

- The Art of Computer Programming
- ≪father of the analysis of algorithms≫

Installation

- TeXworks, Kile, Vim, Emacs etc.
- LaTeX is installed on every computer in this building.
- `apt-get install texlive`

My first document

```
\documentclass[a4paper, 10pt]{article}

\begin{document}
  My first document!
\end{document}
```

- There is several options for `documentclass`.

```
\documentclass[options]{class}
```

- **Options**: font size, paper size, twoside/oneside, landscape etc.
- **Class**: `book`, `article`, `report`, `minimal`, `beamer` etc.

Packages

- For language and typefaces.

```
\usepackage[norsk]{babel}
\usepackage[utf8]{inputenc}
\usepackage[T1]{fontenc}
```

- There is *a lot* of packages with various snacks! More about this later on.

```
\usepackage{hyperref}
\usepackage{mathtools}
\usepackage{listings}
\usepackage{graphicx}
```

Author and title

```
\title{Introduction to \LaTeX{}}
\author{Veronika Heimsbakk\\veronika.heimsbakk@acando.no}

\begin{document}
  \maketitle
\end{document}
```

Sections

```
\section{Section}
This is section 1!

\subsection{Sub section}
This is section 1's sub section.

\subsubsection{Sub sub section}
This is section 1's sub sub section.
```

Paragraphs

```
\paragraph{Paragraph}
This is a paragraph.

\subparagraph{Sub paragraph}
This is an sub paragraph.
```

Comments and new line

```
% Comment.

\newline
\\
```

Text

\textbf	\textit	\texttt	\underline
Bold	*Italic*	`Typeface`	Underline

- Several ways to decorate the text.

```
\textbf{Bold}
\bfseries{Bold}

\textit{Italic}
\itshape{Italic}
```

Text, packages

- Several packages for decorating text.
- `soul`, `color`, ...

```
\st                          \textcolor{red}{Rød tekst}
```

~~Strikethrough~~ Red text

```
\caps                        \so
```

SMALL CAPITALS a i r y l e t t e r s

Text, sizes

`\tiny`	Example
`\scriptsize`	Example
`\footnotesize`	Example
`\small`	Example
`\normalsize`	Example
`\large`	Example
`\Large`	Example
`\LARGE`	Example
`\huge`	Example
`\Huge`	Example

Text, typefaces

`\normalfont`	Example
`\rmfamily`	Example
`\sffamily`	Example
`\ttfamily`	`Example`

- There are **many** typefaces for LaTeX. Take a look at `http://www.tug.dk/FontCatalogue/`

Tables

```
\begin{tabular}[h!]{|l|r|c|}
  \textbf{Table}&\textbf{Table}&\textbf{Table}\\
  \hline
  one&two&three\\
  four&five&six\\
  seven&eight&nine
\end{tabular}
```

Figures

```
\begin{figure}[h!]
  \centering
  \includegraphics[width=\textwidth]{img/latexlogo.png}
  \caption{\LaTeX logo.}
\end{figure}
```

Lists, itemize

- This is an element.
- This is another element.

```
\begin{itemize}
  \item
    This is an element.
  \item
    This is another element.
\end{itemize}
```

Lists, enumerate

1. This is an element.
    1.1 This is another element.

```
\begin{enumerate}
  \item
    This is an element.
  \begin{enumerate}
    \item
      This is another element.
  \end{enumerate}
\end{enumerate}
```

Lists, description

* This is an element.

Element This is another element.

```
\begin{description}
  \item[*] This is an element.
  \item[Element] This is another element.
\end{description}
```

Emph, footnotes and verbatim

- In `verbatim` *everything* is allowed (except from `verbatim`).

```
This is verbatim.
```

This is emph.
Example of footnote.[1]

```
\emph{ ... }
\footnote{ ... }
```

[1] This is footnote.

URLs

- Include the package `hyperref`.

  `http://tug.org/`

  TeX Users Group web site

  veronahe@ifi.uio.no

```
\url{http://tug.org/}
\href{http://tug.org/}{\TeX{} Users Group web site}
\href{mailto:veronahe@ifi.uio.no}{veronahe@ifi.uio.no}
```

Environment, from TeX

```
$ ... $   % Online formula
$$ ... $$ % Exposed formula
```

Online formula $\forall x \in X, \quad \exists y \leq \epsilon$

Exposed formula

$$\forall x \in X, \quad \exists y \leq \epsilon$$

Environment, new in LaTeX

```
\( ... \)  % Online formula
\[ ... \]  % Exposed formula
```

Online formula $\forall x \in X, \quad \exists y \leq \epsilon$
Exposed formula

$$\forall x \in X, \quad \exists y \leq \epsilon$$

- Alternative ways of writing equations
  - `\begin{equation}`
  - `\begin{align}`

$$\forall x \in X, \quad \exists y \leq \epsilon \tag{1}$$

- `align` gives enumerated equations.

Symbols

Symbol	Skript
$\cap$	\cap
$\cup$	\cup
$\subseteq$	\subseteq
$\equiv$	\equiv
$\in$	\in
$\notin$	\notin
$\land$	\land
$\lor$	\lor
$\models$	\models
$\emptyset$	\emptyset
Λ	\Lambda
λ	\lambda

- The Comprehensive LaTeX Symbol List
- LaTeX Wiki Mathematics

Sannhetstabeller

LaTeX is the **perfect** tool for you who take INF1080[2]!

A	B	A $\wedge$ B
0	0	0
0	1	0
1	0	0
1	1	1

[2] Among other courses with textual assignments

lstlistings

```
1 public class Code {
2   public static void main(String[] args) {
3     System.out.println("Hello, world!");
4   }
5 }
```

Settings for lstlistings

```
\lstset{
  language=Java,
  keywordstyle=\color{blue},
  stringstyle=\color{red},
  numbers=left,
  numberstyle=\tiny\color{lightgray},
  tabsize=2
}
```

Using lstlistings

```
\begin{lstlisting}
public class Code {
  public static void main(String[] args) {
    System.out.println("Hello, world!");
  }
}
\end{lstlisting}
```

- May import a code file with `\lstinputlisting{source_filename.py}`

Languages supported by `lstlistings`

ABAP, ACSL, Ada, Algol, Ant, Assembler, Awk, bash, Basic, C#, C++, C, Caml, Clean, Cobol, Comal, csh, Delphi, Eiffel, Elan, erlang, Euphoria, Fortran, GCL, Gnuplot, Haskell, HTML, IDL, inform, Java, JVMIS, ksh, Lisp, Logo, Lua, make, Mathematica, Matlab, Mercury, MetaPost, Miranda, Mizar, ML, Modelica, Modula-2, MuPAD, NASTRAN, Oberon-2, Objective C, OCL, Octave, Oz, Pascal, Perl, PHP, PL/I, Plasm, POV, Prolog, Promela, Python, R, Reduce, Rexx, RSL, Ruby, S, SAS, Scilab, sh, SHELXL, Simula, SQL, tcl, TeX, VBScript, Verilog, VHDL, VRML, XML, XSLT.

- You may add your own keywords to `morekeywords` in `lstset`.

More information

- http://www.mn.uio.no/ifi/tjenester/it/hjelp/latex/
- https://en.wikibooks.org/wiki/LaTeX
- http://tug.org/

Cheers!

Do not hesitate to contact me on veronika.heimsbakk@acando.no!

Next course: Ti*k*Z ♡