# Introduction to LaTeX

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- WinEdt is an editor that is used together with LaTeX.
- We are going to talk about how to use LaTeX using WinEdt

# How to start...

Every LaTeX document has the following structure:

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- Besides `article` there are other document types such as `book`, `slides` etc.
- The command `\usepackage{...}` calls a 'package' that enables you to use non-standard commands.

# LaTeX Commands I

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- Simple commands, that start with a \ followed directly by the command. E.g., \newpage that puts the following text on a new page.
- Commands that have the following structure
  *command*[*options*]{...}.
  An example is \textbf{bold text} that creates **bold text**.

# LaTeX Commands II

- Environments, that start with a `\begin{...}` and end with `\end{...}`. E.g.,

```
\begin{flushright}
This text is on the right.
\end{flushright}
```

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- Attention: LaTeX commands are case-sensitive!

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- To start simply a new line you use `\\`

# Structure

A document can be divided in chapters as follows:

```
\section{name of the chapter...}
text...
\subsection{...}
text...
\subsubsection{...}
text...
\section {...}
...
```

# References

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*text...*

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  ... as outlined in section \ref{ch1} the coefficient of ...

- This is valid as well for tables, graphs, lists etc.

# Tables I

Tables are included using the `table` and `tabular` environments. A typical piece of code is

```
\begin{table}
\centering
\begin{tabular}{l|cc} \hline \hline
& US & GE\\ \hline
GP & 30 & 20 \\
CA & 1.4 & 0.9 \\ \hline \hline
\end{tabular}
\caption{A nice table.}\label{...}
\end{table}
```

# Tables II

The result is

| | US | GE |
|---|---|---|
| GP | 30 | 20 |
| CA | 1.4 | 0.9 |

Table: A nice table

# Lists

The **itemize** environment is suitable for simple lists, the **enumerate** environment for enumerated lists, and the **description** environment for descriptions.
The basic structure is

```
\begin{enumerate}
\item The first issue.
\item Second,...
\item Third,...
\end{enumerate}
```

# Graphics

Graphics are included using the `graphicx` package. The code looks like

```
\begin{figure}
\includegraphics[...]{filename w/o extension}
\caption{a description...}
\label{label for references}
\end{figure}
```

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- directly in the text:
  `The vector $ \beta $ is defined as...`
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- separately as a formula:
  `\begin{eqnarray}`
  `\alpha = \beta + \gamma`
  `\end{eqnarray}`
  which gives:

$$\alpha = \beta + \gamma \tag{1}$$

Besides `eqnarray`, there are other environments such as `equation`, `eqnarray*`...

# Basic Math Commands II

Suppose we would like to write

$$
\begin{aligned}
y_t^i &= c_t + \varepsilon_t^i + a_t \qquad (2)\\
a_t &= \sum_{s=1}^{\infty} \phi_{t-s}
\end{aligned}
$$

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$$\begin{aligned} y_t^i &= c_t + \varepsilon_t^i + a_t \\ a_t &= \sum_{s=1}^{\infty} \phi_{t-s} \end{aligned} \tag{2}$$

- To get $y_t^i$ we write `y^{i}_{t}`
- To get the formulas ordered we use the `eqnarray` environment:

```
\begin{eqnarray}
y^{i}_t&=& c_t+...  \\
a_t &=& ...\nonumber
\end{eqnarray}
```

# Bibliography

There are basically two options:

1. You can create manually a bibliography.
2. You use BibTeX. This needs more time but it is convenient in the long-term.

I am going to present only the first option. I am doing this for the **Harvard** bibliography style.

- A bibliography is an environment. A reference can be created as follows

```
\begin{thebibliography}{999}
\harvarditem [abbr-citation]{full-citation}{citation-year}{cite-key}
...
\end{thebibliography}
```

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```
\begin{thebibliography}{999}
\harvarditem [abbr-citation]{full-citation}{citation-year}{cite-key}
...
\end{thebibliography}
```

- To refer to a reference there are several options. One possibility

```
...as has been shown by \citeasnoun{cite-key}.
```

# Slides?

There are special packages that allow you to create pdf slides for presentation. This presentation has been made using the **beamer**-package.
There are several introductory descriptions in the net. The code for this presentation will be available as well.

# Resources I

- Readings:
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  - Code written by other people (article.tex).
  - Books: See the library in the Badia and in VSP.

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  - Books: See the library in the Badia and in VSP.
- Programmes:
  - **MikTeX, Ghostscript, Ghostview** and **Acrobat Reader** are available for free in the net.
  - Also **WinEdt** can be downloaded but you need a license. You can get it from the computing service.
  - ... that's all you need.

# Resources II

To get new packages for LaTeX

- use the MikTeX package manager.
- If this does not work, try to download them from the Comprehensive TeX Archive Network (CTAN). (See the CTS web site)