

# WU

WIRTSCHAFTS  
UNIVERSITÄT  
WIEN VIENNA  
UNIVERSITY OF  
ECONOMICS  
AND BUSINESS



# Introduction to L<sup>A</sup>T<sub>E</sub>X

## Research Seminar System Analysis

Florian Kragulj

*„LaTeX is not a word processor! Instead, LaTeX encourages authors not to worry too much about the appearance of their documents but to concentrate on getting the right content.“*

([latex-project.org](http://latex-project.org))

- LaTeX is a high-quality typesetting system including features designed for technical/scientific documents.
  - TeX is a Markup Language like HTML or XML.
  - Content and formatting are separated.
  - Not WYSIWYG (*„what you see is what you get“*), but WYSIWYM (*„what you see is what you mean“*)
- De facto standard for scientific publishing (particularly in natural sciences and informatics)
- LaTeX is an extension of TeX.

# LaTeX vs. word processors

- High typeset quality
- Code is independent of OS – implementations exist for all platforms.
- Security: Content stored in plain text
- Reliable for large documents
- Easy to include formulas
- Easily scriptable
- LaTeX is free

# Files used

- `.tex` file ... LaTeX file (text file) with your content
- `.bib` file ... BibTeX file with all references
- `.ps` / `.pdf` ... the resulting output file(s)

(and some other [temporary] files which are generated automatically)

**→ Use the templates provided on learn@WU!**

# Simple LaTeX example

```
\documentclass{article}
\title{Simple Example}
\author{Florian Kragulj}
\date{March 2015}
\begin{document}
\maketitle
Hello world!
\end{document}
```

# Simple LaTeX example - Result

## Simple Example

Florian Kragulj

March 2015

Hello world!

# Simple BibTeX example

```
@ARTICLE{stix2000,  
  author = {Bomze, I. M. and Pelillo, M. and Stix, V.},  
  title = {Approximating the maximum weight clique using replicator dynamics},  
  journal = {{IEEE} Transactions on Neural Networks},  
  year = 2000,  
  volume = 11,  
  number = 6,  
  pages = {1228--1241}  
}  
  
@INPROCEEDINGS{hicss46stix,  
  author = {Maida M. and Maier K. and Obwegeser N. and Stix V.},  
  title = {Success of Multi Criteria Decision Support Systems: The Relevance of  
Trust},  
  booktitle = {Proc. 46th Hawaii Int. System Science {(HICSS)} Conference},  
  year = {2013},  
  pages = {213--218}  
}  
  
@BOOK{gzm,  
  author = {Bernroider E. and Stix V.},  
  title = {Grünzüge der Modellierung},  
  publisher = {Facultas},  
  address = {Vienna},  
  year = {2006}  
}
```

# Body of text I - Basics

- Start with `\begin{document}`
- End with `\end{document}`
- **Typesetting Text**
  - New Line `\\` or `\newline`
  - **Bold** `\textbf{.....}` or `\bf`
  - *Italics* `\emph{.....}` or `\textit{.....}` or `\it`
  - Underline `\underline{.....}` or `\ul`



# Body of text II - Sections

(available sections are dependent on the document class used; e.g. article)

- `\section{Introduction}`
- `\subsection{Research Question}`
- `\subsubsection{RQ 1}`

## 1 Introduction

### 1.1 Research Question

#### 1.1.1 RQ 1

→ *Do not worry about the numbering*  
– *LaTeX does it automatically!*

# Body of text III – Lists

## ■ Numbered list

```
\begin{enumerate}  
\item This is first.  
\item This is second.  
\end{enumerate}
```

1. This is first.
2. This is second.

## ■ Bullet point list

```
\begin{itemize}  
\item This is first.  
\item This is second.  
\end{itemize}
```

- This is first.
- This is second.

# Bibliography I

Bibliography information is stored separately, in a BibTeX file (`.bib`).

1. Store all references used in your `.bib` file and define abbreviations – advisably beforehand.
2. Link your `.tex` file with your `.bib` file by these commands:

```
\bibliographystyle{plain}
```

```
\bibliography{your-file.bib}
```

3. Use the abbreviations in your `.tex` file to cite a reference from the `.bib` file.

# Bibliography II - Example

## bib-file

```
@BOOK{maturana1992,  
author = {Maturana H. R. and Varela F. J.},  
title = {The tree of knowledge: The biological roots of human understanding},  
publisher = {Shambhala},  
address = {Boston},  
year = {1992}  
}
```

## tex-file

```
``To live is to know.`` \cite[p. 174]{maturana1992}
```

## Result

“To live is to know.” [1, p. 174]

### References

- [1] Maturana H. R. and Varela F. J. *The tree of knowledge: The biological roots of human understanding*. Shambhala, Boston, 1992.

Abbreviation  
(reference) -  
Link to .bib file; has  
to be defined there.

# Extended LaTeX example

```
\documentclass{article}  
\title{Simple Example 2}  
\author{Florian Kragulj}  
\date{March 2015}
```

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

Hello world!

```
\section{Introduction}  
\textbf{Lorem ipsum dolor} sit amet, \textit{consectetur adipiscing elit.}
```

```
\subsection{Research question}  
Rhoncus ut, imperdiet a, venenatis vitae, justo.
```

```
\begin{itemize}  
\item \underline{Nullam} dictum felis eu pede mollis pretium. Integer tincidunt.  
\item Cras dapibus.
```

```
\end{itemize}  
Vivamus elementum semper nisi. Aenean vulputate eleifend tellus. Aenean leo ligula, porttitor eu, consequat vitae, eleifend ac,  
enim. Aliquam lorem ante, dapibus in, viverra quis, feugiat a, tellus. ``To live is to know." \cite[p. 174]{maturana1992}
```

```
\bibliographystyle{plain}  
\bibliography{MyReferences}
```

```
\end{document}
```

# Extended LaTeX document

## - Result

## Simple Example 2

Florian Kragulj

March 2015

Hello world!

### 1 Introduction

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

#### 1.1 Research question

Rhoncus ut, imperdiet a, venenatis vitae, justo.

- Nullam dictum felis eu pede mollis pretium. Integer tincidunt.
- Cras dapibus.

Vivamus elementum semper nisi. Aenean vulputate eleifend tellus. Aenean leo ligula, porttitor eu, consequat vitae, eleifend ac, enim. Aliquam lorem ante, dapibus in, viverra quis, feugiat a, tellus. “To live is to know.” [4, p. 174]

### References

- [1] Maturana H. R. and Varela F. J. *The tree of knowledge: The biological roots of human understanding*. Shambhala, Boston, 1992.

# Templates and software

- Templates → **learn@WU**
  - `MyPaper.tex`
  - `MyReferences.bib`
- Software tools
  - Suggested tools
    - Windows only: **MiKTeX** (LaTeX base; *install first!*)  
+ **TeXnicCenter** (LaTeX editor)
    - **JabRef** (bibliography reference manager)
  - Alternative tools
    - **TeXstudio** (*Linux, MacOS, Windows*)
    - **Mendeley** (*powerful* reference manager; free, but closed source)

# Further references

- [learn@WU](#)  
*Tutorial paper for this seminar*
- <http://www.lehmanns.de/page/latexreferenz>  
*e-book with most important commands*
- <http://latex.tugraz.at/>  
*Comprehensive support portal*
- <http://latex.tugraz.at/latex/tutorial>  
*Tutorial for beginners*



# FAQ

- Pay attention to the the encoding used in your LaTeX editor (e.g. ANSI, UTF-8).
- To be contd.