LaTeX for Economics and Business Administration (Part II)

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Introduction

- Pros and cons of LaTeX

- Why bother with learning LaTeX
    - for consistent/structured lay-out
    - better automation of workflow

- Compiling, referencing, formula's, text control

This session we look at

- Packages (controlling the preamble)
- Tables (inserting plain tables)
- Automatizing tables (complex tables)
- Better looking references
- Making slides

Note: we will only touch upon these subjects

Note2: All materials can be downloaded from
http://thomasdegraaff.nl/LaTeX-Workshop/notes/02-more-notes.html

Packages, packages, and packages

The use of packages

- Typically, packages are used to change appearance
- To ensure no errors, usually opt for the full installation or have access to internet
- There are lots of them, see CTAN
- Often used packages
    - amsmath, graphicx, marvosym, microtype, booktabs, dcolumn, lipsum, fullpage, natbib, hyperref
- format:

```
1  \usepackage[colorlinks=true,citecolor=magenta,
2              urlcolor=magenta]{hyperref}
```

The use of classes

- Typically one uses the `article` class—actually `scrartcl`
- However, there is as well a `book`, `mininal`, `report`, `beamer` class etcetera
- Specific user written classes are `Koma-Script` and `elsarticle` classes
- Classes come with options such as

```
1  \documentclass[12pt, a4paper]{article}
```

General structure

```latex
1  \documentclass[twocolumn, a4paper]{article}
2  % Preamble: how should it look like
3  \usepackage{multicol, lipsum}
4  \usepackage[english, german]{babel}
5  \begin{document}
6          % Body: the real contents
7          \lipsum
8  \end{document}
9
```

Exercise: fluff it up!

With a cool paper:

1. Use the `scrartcl` class with options: 11pt, abstracton, notitlepage
2. Now add option parkskip (and perhaps twocolumn)
3. One by one add the following packages and see what happens:
   3.1 package fullpage
   3.2 package fourier
   3.3 package setspace with command thereafter `doublespace`

natbib & biblatex

Default format is BibTeX—customizable (however limited).
Default is good (except: use natbib!)
If you want to customize quite a lot: biblatex package!

```latex
\usepackage[style= authoryear-icomp,
            backend=bibtex,
            natbib=true,
            firstinits=true,
            backref=true,
            maxnames=2,
            maxbibnames=10]
                {biblatex}
\bibliography{mybib.bib}

\printbibliography
```

Create a reference list by:

1. citing some people, note:

```
1  \citet{refid} % in text citation
2  \citep[][]{refid} % between parentheses
3
```

2. Indicate where the bibliography should be

Figures

Figures

Figures/graphs and tables in a floating environment

```
1  \begin{figure}[htbp!]}
2          \center
3          \includegraphics[]{ligatures_latex}
4          \caption{A figures about ligatures}
5          \label{fig:ligatures}
6  \end{figure}
```

Figures can be `.pdf`, `.jpg`, `.png` and a whole lot of other types (but not bitmaps!)

1. Insert the file Powerphluff.jpg and use the command

```
width = 0.8\textwidth
```

   to control the size

2. Give the figure an appropriate caption (something perhaps with source)

Tables

Tables

```
1  \begin{table}[t!]
2          \caption{This is the caption}
3          \begin{tabular}{lcr}
4                  \hline
5                  first & row & data \\
6                  second & row & data \\
7                  \hline
8          \end{tabular}
9          \label{tab:example}
10 \end{table}
```

Internal references are a breeze

```
1  \label{}        % Label something
2  \ref{}        % Refer to that
3  \footnote{}        % Add footnote
4  \thanks{}        % For in title
5
```

dcolumn and booktabs package

```latex
\usepackage{booktabs, dcolumn} % in preamble
\newcolumntype{d}{D{.}{.}{2}}  % in preamble
\begin{table}[t!]
        \caption{This is the caption}
        \begin{tabular}{ldd}
                \toprule
                Student & Grade 1 & Grade 2 \\
                \midrule
                Mike    & 7.8 & 9   \\
                Andrea  & 6   & 8.2 \\
                \bottomrule
        \end{tabular}
        \label{tab:example2}
\end{table}
```

Create the following table

Table 1: Average grades

First name	Surname	Grade
Sherlock	Holmes	7.9
John H.	Watson	8.1

Some R code

```
library(texreg)

control <- c(4.17, 5.58, 5.18, 6.11, 4.50, 4.61, 5.17, 4.53, 5.33, 5.14)
treated <- c(4.81, 4.17, 4.41, 3.59, 5.87, 3.83, 6.03, 4.89, 4.32, 4.69)
group <- gl(2, 10, 20, labels = c("Control", "Treated"))
weight <- c(control, treated)
m1 <- lm(weight ~ group - 1)
m2 <- lm(weight ~ group)

texreg(list(m1, m2), dcolumn = TRUE, booktabs = TRUE, file = "Table.tex",
use.packages = FALSE, label = "tab:3", caption = "Two linear models.",
float.pos = "hb!")
```

which saves a file "Table.tex" to the same directory

Resulting table

	Model 1	Model 2
groupControl	5.03***	
	(0.22)	
groupTreated	4.66***	-0.37
	(0.22)	(0.31)
(Intercept)		5.03***
		(0.22)
R^2	0.98	0.07
Adj. R^2	0.98	0.02
Num. obs.	20	20
RMSE	0.70	0.70

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 2: Two linear models.

Exercise: Be as lazy as possible!

Now

```
1  \input{Table.tex}
```

produces your table

- Do it!

Slides

Slides are typically made with the beamer class

Beamer style

You can change the beamer style by:

```
1  \usetheme{Hannover}
2  \usecolortheme{dove}
3
4  % to remove those navigation symbols
5  \beamertemplatenavigationsymbolsempty
6
```

(https://www.hartwork.org/beamer-theme-matrix/ gives all possible combinations

Create a couple of slides containing at least

- Titlepage
- Introduction
- Conclusion

Conclusion

In conclusion

- LaTeX is a very powerful structured language especially suitable for
  - large complex documents;
  - documents with many formula's.

- Big advantage: you really need to think

- Not for every one; steep learning curve, but

- large community (google it)

- Markup language (especially, Markdown) becomes more and more wide-spread: LaTeX is a good start