LaTeX for Economics and Business Administration (Part II)

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Previously

- 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)
- Figures (how to insert them?)
- Tables (inserting plaing tables)
- Automatizing tables (complex tables)
- Better looking references
- Making slides

Note: we will only touch upon these subjects

The use of packages

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

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

The use of classes

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

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

General structure

```
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
```

natbib & biblatex

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

```
1 \usepackage[style= authoryear-icomp,
2             backend=bibtex,
3             natbib=true,
4             firstinits=true,
5             backref=true,
6             maxnames=2,
7             maxbibnames=10]
8                     {biblatex}
```

Figures

Figures/graphs and tables in a floating environment

```
\begin{figure}[h!]
        \center
        \includegraphics{ligatures_latex}
        \caption{A figures about ligatures}
        \label{fig:ligatures}
\end{figure}
```

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

Tables

```
\begin{table}[t!]
        \caption{This is the caption}
        \begin{tabular}{lcr}
                \hline
                first & row & data \\
                second & row & data \\
                \hline
        \end{tabular}
        \label{tab:example}
\end{table}
```

Referencing

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

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

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)
m2 <- lm(weight ~ group - 1)

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

Statistical output

Now

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

produces:

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

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

Table: Two linear models.

Slides

Slides are typically made with the beamer class

```
1  \documentclass{beamer}
2  \title{Another lecture}
3  \author{By a wisecrack lecturer}
4
5  \begin{document}
6    \frame{\titlepage}
7
8    \begin{frame}{Introduction}
9  %       Typically a quote from a long
10 %       dead philosopher that should
11 %       make the lecturer look smart
12 %       but usually does not.
13   \end{frame}
14 \end{document}
```

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

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