

Proseminar Wurzeln der Informatik

L^AT_EX Introduction

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Theory of Hybrid Systems

SS 2015

- 1 General \LaTeX Introduction
- 2 \LaTeX Document
- 3 \LaTeX Beamer
- 4 $\text{BIB}\TeX$: References in \LaTeX
- 5 Getting Help

Two Typesetting Philosophies

WYSIWYG

“What you see is what you get – but usually not what is printed.”

- e.g. Microsoft Word or OpenOffice
- much freedom in layout
- no compilation phase

T_EX / L^AT_EX

“Tell the computer what you want to be printed.”

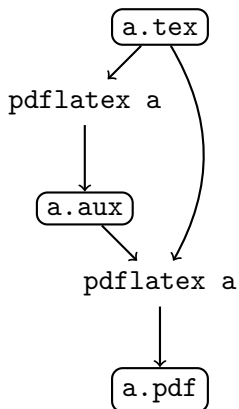
- Donald E. Knuth, “The T_EXbook”, 1984 (L^AT_EX: macro package for T_EX by Leslie Lamport)
- typesetting text and mathematical formulas in a professional way
- document has to be compiled into, e.g., a PDF

From: The Not So Short Introduction to L^AT_EX 2_ε

Workflow

Organized like source code

- Write source text
- Compile source text
- Obtain pdf file



Distributions

Linux
[T_EXLive](#)

Windows
[MiK_TE_X](#)

Mac
[Mac_TE_X](#)

Distributions

Linux
[TeXLive](#)

Windows
[MiKTeX](#)

Mac
[MacTeX](#)

Recommended Editors

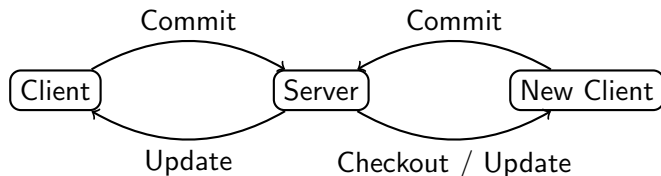
Linux
[Kile](#)

Windows
[TeXnicCenter](#)

Mac
[TeXShop](#)

Excursion: SVN

- Software versioning and revision control system
- Similar to: git, CVS, mercurial, ...



What you need:

- username: *testflorian*
- password: ...
- repository url: https://svn-i2.informatik.rwth-aachen.de/repos/proseminar_roots_of_cs

Most Important Subversion Commands

- `svn help`
Show available commands
- `svn checkout <repository url>`
Checkout existing repository
- `svn update`
Download new revisions from server
- `svn add <path>`
Add file or folder to repository
- `svn commit`
Upload local changes to server
- `svn remove <path>`
Remove file or folder from repository

Linux: `subversion`, Windows: `TortoiseSVN`

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Very Rough Structure of a \LaTeX Document

```
\documentclass{article}  
\usepackage[utf8]{inputenc}  
\usepackage[<options>]{<package name>}
```

```
\newcommand{\True}{\texttt{True}}  
\newcommand{<name>}{<definition >}
```

```
\begin{document}
```

Content

```
\end{document}
```

Common packages

- `inputenc`: Encoding of the input file
- `babel`: Language of the content, used for hyphenation
- `amsmath`, ...: Common math symbols
- `color`, `xcolor`: Colors
- `listings`: Source code listings
- `hyperref`: Typesetting of links, emails, ...
- `graphicx`: Include pictures
- `tikz`: Graphics and plots within \LaTeX

Common commands

- Commands: `\<command name>\{\<argument>\}`
- Environment: `\begin\{\<name>\}...\end\{\<name>\}`

Common commands

- Commands: `\<command name>\{<argument>\}`
- Environment: `\begin\{<name>\}... \end\{<name>\}`
- Syntactic elements: `$....$, ~, \\, ...`
- Symbols: `\pi` → π , `\cup` → \cup , `\sum` → \sum , ...
- Content Structure: `\section, \subsection, \tableofcontents, ...`
- File Structure: `\input\{<file name>\}`
- Pictures: `\includegraphics`
- Tables: `\begin\{tabular\}`
- Graphics: `\begin\{tikzpicture\}`
- Lists: `\begin\{itemize\}, \begin\{enumerate\}`
- Theorems: `\begin\{theorem\}, \begin\{proof\}, ...`
- Columns: `\begin\{columns\}`
- ...

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A presentation consists of *slides*.

- Slides can be created with the beamer class:

```
\documentclass{beamer}
```

- Content is structured in slides:

```
\begin{frame}{Frame title}
```

```
The content
```

```
\end{frame}
```

- Content is normal L^AT_EX content
- Some commands have additional options:

```
\tableofcontents
```

Using L^AT_EX Beamer themes

- **color theme**: Style for color theme
- **inner theme**: Style for content elements
 - titlepage
 - itemize, enumerate and description environments
 - block, theorem and proof environments
 - figures and tables
- **outer theme**: Style for structural elements
 - head- and footline
 - frametitle
 - sidebars
 - logo
 - navigation symbols and bars

Start with our template, change at will.

Special L^AT_EX Beamer commands

```
\begin{block}{Title of the block}  
The content of the block.  
\end{block}
```

Title of the block

The content of the block.

Also: `\begin{exampleblock}`, `\begin{alertblock}`, ...

Title of the exampleblock

The content of the exampleblock.

Title of the alertblock

The content of the alertblock.

The Theorem Environment

Theorem (Title of the theorem)

The content of the theorem environment.

proof name.

The content of the proof.

Analogous environments:

- definition
- corollary
- fact
- lemma
- proof
- define your own...

- Basic: `\pause`
Text after `\pause` appears on the next slide.

- Basic: `\pause`

Text after `\pause` appears on the next slide.

- Advanced: `\only`, `\uncover`, `\onslide`, `\visible`, `\invisible`, `\alt`, `\temporal`, ...

Show some content only on certain slides.

Subtle differences:

- Show or hide on given slides?
- Show only on slides or show alternatives beforehand or afterwards?
- Reserve space for the content?

- Also integrated into other commands ...

`\item<...>`, `\includegraphics<...>`, `\label<...>`

- Also integrated into other commands ...

`\item<...>`, `\includegraphics<...>`, `\label<...>`

- ... in TikZpictures ...

u_1

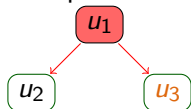
- Also integrated into other commands ...

`\item<...>`, `\includegraphics<...>`, `\label<...>`

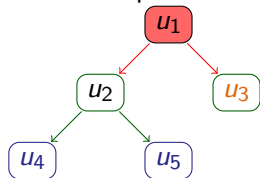
- ... in TikZpictures ...

u_1

- Also integrated into other commands ...
`\item<...>`, `\includegraphics<...>`, `\label<...>`
- ... in TikZpictures ...



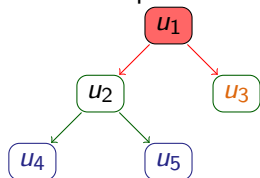
- Also integrated into other commands ...
`\item<...>`, `\includegraphics<...>`, `\label<...>`
- ... in TikZpictures ...



- Also integrated into other commands ...

`\item<...>`, `\includegraphics<...>`, `\label<...>`

- ... in TikZpictures ...



- ... and as environments.

`\onlyenv`, `\altenv`

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Organize your references with BIBTEX

- Separate file a.bib
- Special syntax
- Referenced within .tex files

```
% http://dl.acm.org/citation.cfm?id=1373322
@book{Baier:2008:PMC:1373322,
  author = {Baier, Christel and Katoen, Joost-
    Pieter},
  title = {Principles of Model Checking (
    Representation and Mind Series)},
  year = {2008},
  isbn = {026202649X, 9780262026499},
  publisher = {The MIT Press},
}
```

Different entry types for different sources:

- `@article`: Journal paper
- `@book`: Whole books
- `@inbook`: Single chapter from a book
- `@inproceedings`: Conference paper
- and some more...

Type determines

- How entry is displayed
- What information is needed

- Include bibliography in \LaTeX document:

```
 $\backslash$  bibliographystyle {alpha}  
 $\backslash$  bibliography {<filename>}
```

- Reference entry:

Some text from this book \backslash **cite** {<entry name>}

Several styles are available:

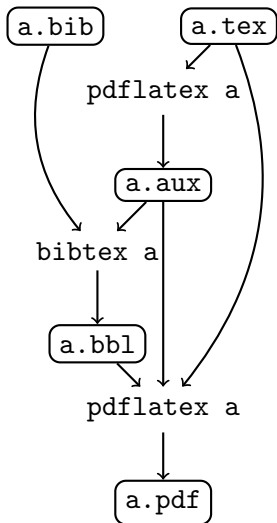
- `abbrv`: [1]
- `alpha`: [BK08]
- some more...

Obtaining BIBTEX references

Many pages offer download of ready-to-use BIBTEX references

- dl.acm.org
Tools and Resources > Export Formats > BibTeX
- scholar.google.com
Cite > BibTeX
- dblp.uni-trier.de
Download icon (export record as) > BibTeX
- link.springer.com
Other actions > Export citation > BibTeX

Workflow with BIBTEX



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Some help for \LaTeX

- Helpful information for \LaTeX in general
`en.wikibooks.org/wiki/LaTeX`
- Specific symbols from \LaTeX packages
search for "symbols a4"
`detexify.kirelabs.org`
- Extensive \LaTeX Beamer user guide
search for `beamer user guide`
- Creating \LaTeX graphics with TikZ and PGF
`www.texample.net/tikz/`

Some help for BIBTEX

- Detailed BIBTEX documentation:
`www.ctan.org/tex-archive/biblio/bibtex/contrib/doc/`
- Comfortable BIBTEX database editor:
`jabref.sourceforge.net`
- Anything else:
`www.bibtex.org`