Summary

Most useful LaTeX syntax and features summarized in one document

Martchus

January 14, 2016

Source code is available at https://github.com/Martchus/latex-summary

Contents

1 Document-wide commands **4**
- 1.1 Important packages . . . 4
- 1.2 Geometry . . . 4

2 Escaping **5**

3 Document structure **5**
- 3.1 Labels/anchors and references . . . 6
- 3.2 Manipulate the table of contents . . . 6
- 3.3 Manual breaks . . . 6
- 3.4 Example . . . 6

4 Spacing and ellipsis **7**
- 4.1 Spacing between lines . . . 7
- 4.2 Paragraphs . . . 7
- 4.3 Miscellaneous . . . 8

5 Alignment **8**

6 Quotes and footnotes **8**

7 Floating environments **8**
- 7.1 Preferred position . . . 8
- 7.2 Useful commands in floating environments . . . 9
- 7.3 Parameter . . . 9

8 Notations **9**
- 8.1 Units . . . 9
- 8.2 Colors . . . 9

9 Mathematical stuff **10**
- 9.1 Environments . . . 10
- 9.2 Mathematical notations . . . 10
- 9.3 Letters and symbols . . . 11
- 9.4 Spacing . . . 11

10 Hyphenation **11**
- 10.1 Hypens, dashes . . . 12

11 Font **12**
- 11.1 Family and style . . . 12
  - 11.1.1 Overriding defaults . . . 12
  - 11.1.2 Setting fonts with packages . . . 13
  - 11.1.3 Common font family names . . . 13
- 11.2 Size . . . 13
- 11.3 Color . . . 14
- 11.4 Special characters . . . 14
  - 11.4.1 Quotation marks . . . 14
  - 11.4.2 Miscellaneous . . . 14

11.5 Sections, paragraphs, . . . 15
12 Enumerations 15
13 Boxes, frames 15
13.1 fancybox 15
13.2 Minipages 16
14 Graphics 16
14.1 Annotations 16
14.2 Drawings 17
15 Tables 17
15.1 Column definitions 18
15.2 Floating tables 18
16 Including source code 18
16.1 lstlisting options 19
17 Biblography 19
17.1 Manual bibliography 19
17.2 Automatically generated bibliography 20
17.2.1 Styles 20
17.2.2 *.bib-File example 20
17.2.3 Compilation steps 20
18 Index 21
18.1 Syntax 21
18.2 Compilation steps 21
19 Nomenclature/symbol table 21
19.1 Compilation steps 21
20 Customization 21
20.1 Commands 22
20.2 Environments 22
20.3 Counter 22
20.4 Lengths 22
20.5 Comparsion operations 22
20.6 Document classes 23
20.7 Packages 23
21 Koma-Script 23
21.1 Classes 23
21.2 Packages 23
22 PDF tweaks 23
22.1 PDF specific configuration (example) 23
22.2 Links and bookmarks 24
22.3 PDF inclusion 24
23 Presentations 24

24 Further information 25

1 Document-wide commands

Command	Effect
`\documentclass[options]{class}`	sets document class (`article`/`report`/`book`/`letter`/`scrartcl`. . .) and related options (`10pt`. . . `12pt`, `fleqn`/`leqno`, `titlepage`/`notitlepage`, `twocolumn`/`twoside`, `a4paper`/`a5paper`, `draft`, `landscape`)
`\usepackage[options]{pkgname}`	imports commands from the specified package
`\input{file}`	includes the specified file
`\include{file}`	includes the specified file (new page)
`\author{val}, \title{val}, \date{val}`	sets metadata (used by `\maketitle`)
`\begin{document}, \end{document}`	defines boundries of the actual text

1.1 Important packages

Command	Effect
`\usepackage[lng]{babel}`	provides `\selectlanguage{lng}`, `\foreignlanguage{lng}{text}` which affect commands like `\today`
`\usepackage[latin1/utf8/...]{inputenc}`	sets the specified input encoding
`\usepackage[T1/...]{fontenc}`	sets the specified font encoding
`\usepackage{nameref}`	provides named references via `\nameref{}`, see 3.1: Labels/anchors and references
`\usepackage{amsmath}`	provides 9: Mathematical stuff
`\usepackage{caption}`	provides `\captionof{ }`, see 7: Floating environments
`\usepackage{xcolor}`	provides colors, see 8.2: Colors
`\usepackage{hyperref}`	provides bookmarks, hyperlinks and PDF specific settings, see also 22: PDF tweaks.
`\usepackage{geometry}`	allows to set page geometry, see 1.2: Geometry
`\usepackage{microtype}`	tunes line breaks

1.2 Geometry

With the `geometry` package page geometry can be set using `\geometry{a4paper,left=45mm,...}`.

Option	Effect
`left, right, bottom, top`	specify borders
`bindingoffset`	specifies the binding offset
`includehead, includefoot`	whether head and foot notes include borders

2 Escaping

The following characters have special meaning and must be escaped: `& % $ # _ { } ~^\`

Character(s)	Escape with
`& % $ # _ { }`	backslash, eg. `\&`
`~`	`\textasciitilde`
`^`	`\textasciicircum`
`\`	`\textbackslash`

Notes

- Defining shortcuts might be useful, eg.: `\newcommand{\bs}{\textbackslash}`
- For including source code, see section 16. For special characters, see section 11.4.
- The following characters mustn't be escaped: `[] () / ! ? * :`
- The following special characters can be used in label/color IDs (*without* escaping): `_ :`
- The character *sequences* `"' "` `` "` `` `'' ''` are special Quotation marks and must be escaped using eg. `"{}'`.

3 Document structure

Command	Effect
`\part{title}`	level -1 in book and report, level 0 in article
`\chapter{title}`	level 0 in book and report
`\section{title}`	level 1
`\subsection{title}`	level 2
`\subsubsection{title}`	level 3
`\paragraph{title}`	level 4
`\subparagraph{title}`	level 5
`\appendix`	starts the appendix
`\maketitle`	generates the cover sheet
`\tableofcontents`	generates the table of contents (see also 3.2: Manipulate the table of contents)

3.1 Labels/anchors and references

Command	Effect
`\label{anchor_id}`	defines an anchor
`\ref{anchor_id}`	prints the index of the specified anchor
`\nameref{anchor_id}`	prints the name of the specified anchor
`\pageref{anchor_id}`	prints the page of the specified anchor

It might be useful to combine `\ref` and `\nameref`:

```
\newcommand{\fullref}[1]{\ref{#1}:~\nameref{#1}}
```

3.2 Manipulate the table of contents

Command	Effect
`\section[toc_title]{title}`	sets a toc-specific title
`\section*{title}`	disables index and appearance in toc
`\addcontentsline{toc}{section_level}{text_entry}`	adds an additional entry

3.3 Manual breaks

- Manual line breaks can be inserted using `\\` or `\newline`. For a line break in a table cell a `\minibox` from the `minibox` package can be used.
- A new paragraph is achieved by inserting an empty line or using the `\par` command.
- A page break can be inserted using `\newpage`.
- A page break can be inserted using `\clearpage` which also forces LaTeX to print all remaining 7: Floating environments.

3.4 Example

```
% set document class
\documentclass[a4paper,12pt,DIV15]{scrartcl}

% meta data
\title{\LaTeX{} summary}
\author{Martchus}

% package imports
% page geometry
\usepackage{geometry}
\geometry{a4paper,left=20mm,right=20mm,top=20mm,bottom=20mm}
% language and hyphenation
\usepackage[english]{babel}
```

```
\selectlanguage{\english}
% text encoding
\usepackage[T1]{fontenc}
\usepackage[utf8]{inputenc}
% colors
\usepackage{xcolor}

% start actual document
\begin{document}

% actual content
\maketitle
\clearpage
\tableofcontents
\clearpage

\section{Section}
    \subsection{Subsection}

% close document
\end{document}
```

4 Spacing and ellipsis

4.1 Spacing between lines

These commands requires the `setspace` package.

Command	Effect
`\singlespacing`	sets line spacing to 1.0
`\onehalfspacing`	sets line spacing to 1.5
`\doublespacing`	sets line spacing to 2.0
`\begin{singlespace}`, `\begin{onehalfspace}`, ..., `\begin{spacing}{factor}`	begins environmenmt with specific line spacing

4.2 Paragraphs

- Spacing can be controlled with `\setlength{\parskip}{spacing}`.
- Indention can be controlled with `\setlength{\parindent}{indent}`.

4.3 Miscellaneous

Command	Effect
`\dots`	inserts ellipsis: . . .
`\hspace{space}`	inserts horizontal space
`\vspace{space}`	inserts vertical space
`\hfill \hrulefill \dotfill`	horizontal filling
`\vfill`	vertical filling

5 Alignment

Command/environment	Alignment
`flushleft`	left
`flushright`	right
`center`	center

6 Quotes and footnotes

Command	Effect
`\begin{quote} ...\end{quote}`	wraps a quote
`\footnote{text}`	makes a footnote with the specified text

7 Floating environments

Environment	Use
`table`	to include tables (`tabular`), see 15.2: Floating tables
`figure`	to include graphics with `\includegraphics`, see 14: Graphics
`wrapfigure`	to include graphics with `\includegraphics`, allows to have text wrapped around the figure, requires the `wrapfig` package
`subfloat`	nested figure, requires the `subfig` package
`lstlisting`	to include source code, see 16: Including source code

7.1 Preferred position

Option	Effect
`h`	here
`t`	top of page
`b`	bottom of page
`p`	separate page
`!`	increases the priotiry

These options can be specified as usual in square brackets and might be combined.

7.2 Useful commands in floating environments

Command	Effect
`\centering`	centers the environment
`\caption[toc_text]{text}`	inserts a description for the figure/table/. . .
`\label`	see 3.1: Labels/anchors and references, must be **after** the `\caption` command
`\captionof{floating_env_type}[toc_text]{text}`	same as `\caption` but allows to specify the type of the floating environment, requires the `caption` package

7.3 Parameter

Command	Meaning
`\topfraction`	fraction for floats at the beginning of a page
`\bottomfraction`	fraction for floats at the end of a page
`\textfraction`	minimum fraction for text on a page

Parameters can be changed using eg. `\renewcommand{\topfraction}{0.6}`.

8 Notations

8.1 Units

- `mm, cm, in` . . . : milimeter, centimeter, inch
- `pt` : Punkt 0.3515 mm
- `pc` : Pica 12 pt
- `cc` : Cicero ≈ 4.53 mm
- `ex`, `em` : height of small `x`, width of capital `M`
- `\baselineskipt` : height of a line

8.2 Colors

- require the package `xcolor`.
- pre-defined colors: `blue violet green red ...`
- custom colors: `\definecolor{custom_name}{scheme}{values}`
  - schemes: `rgb cmyk HTML` . . .
  - examples: `\definecolor{red1}{HTML}{AA0000}` `\definecolor{blue1}{rgb}{0.1,0.1,1.0}`
- mixing colors: `red!50 blue!70!green!50`

9 Mathematical stuff

The `amsmath` package must be included for most commands and environments.

9.1 Environments

Command	Effect
`$ some formula $`	defines an inline formula
`\begin{equation} ... \end{equation}`	defines a *single*-line formula block
`\begin{align} ... \end{align}`	defines an aligned *multi*-line formula block (one equation tag for each line)
`\begin{align} ... \end{align}`	defines a non-aligned *multi*-line formula block (one equation tag for each line)
`\begin{multline} ... \end{multline}`	defines a non-aligned *multi*-line formula block (one equation tag for all lines)

9.2 Mathematical notations

Command	Effect
`\frac{numerator}{denominator}`	fraction: $\frac{\text{numerator}}{\text{denominator}}$
`\sqrt[n]{a}`	root: $\sqrt[n]{a}$
`\cos(45\hat{\circ}) = \cos(\pi/4)`	$\cos(45\hat{\circ}) = \cos(\pi/4)$
`\hat{up} _{down}`	$\hat{up}_{down}$
`\sum_{n=1}\hat{12}{f(x_n)}`	sum: $\sum_{n=1}\hat{12}{f(x_n)}$
`\prod ...`	product: $\prod \ldots$
`\int ...`	integral: $\int \ldots$
`\iint ...`	integral of integral: $\iint \ldots$
`\lim ...`	limes: $\lim \ldots$
`\left( \right)`	scaled brackets (can also be used with `{} [] <>`)

`\bs begin{cases}`
`  p & p \neq 0 \\ \infty & p = 0`
`\end{cases}`
	cases: $\begin{cases} p & p \neq 0 \\ \infty & p = 0 \end{cases}$

9.3 Letters and symbols

Command	Effect
`\alpha \beta`	greek letters: α β
`\neq \leq \geq`	equation signs: $\neq \leq \geq$
`\in \notin`	(not) in set: $\in \notin$
`\infty`	infinity: ∞
`\phantom { }`	spacing in size of argument
`\mathrm{ }`	roman font in formula
`\text{ }`	regular text in formula
`\mathbf{ }`	bold text in formula
`\mathit{ }`	italic text in formula
`\mathbb{N C R}`	math bold: $\mathbb{NCR}$, requires `asmfonts` package
`\leftarrow \rightarrow`	
`\longleftarrow \leftrightarrow`	arrows: $\leftarrow$ $\rightarrow$ $\longleftarrow$ $\leftrightarrow$
`\overrightarrow{x}`	$\overrightarrow{x}$

9.4 Spacing

Command	Space
`\, \thinspace`	$\rightarrow\leftarrow$
`\: \medspace`	$\rightarrow\leftarrow$
`\; \thickspace`	$\rightarrow\leftarrow$
`\enskip`	$\rightarrow\ \leftarrow$
`\quad`	$\rightarrow\quad\leftarrow$
`\qquad`	$\rightarrow\qquad\leftarrow$
`\! \negthinspace`	$\rightarrow\!\!\!\leftarrow$
`\negmedspace`	$\rightarrow\!\!\!\leftarrow$
`\negthickspace`	$\rightarrow\!\!\!\leftarrow$

10 Hyphenation

- Automatic hyphenation can be prevented using ~ or `\mbox{ }`.
- Manual hypenation can be inserted with `\-`.
- Global hypenation rule can be defined using `\hypenation{ }`, eg. `\hypenation{hy-phen-ate}`.

10.1 Hypens, dashes

Notation	Dash	
-	hypen	-
\textendash	dash	–
$-$	minus sign	−

11 Font

11.1 Family and style

Command	Effect
\rmfamily, \tesubsubsectionxtrm{ }	roman
\sffamily, \textsf{ }	sans-serif
\ttfamily, \texttt{ }	typewriter
\scshape, \textsc{ }	small-caps
\itshape, \textit{ }	*italic*
\bfseries, \textbf{ }	**bold**
\fontfamily{family}\selectfont	specifies font family of following text

11.1.1 Overriding defaults

Variable	Default	Activated by
\familydefault	\rmdefault	\normalfont, \textnormal{ }
\rmdefault	cmr	\rmfamily, \textrm{ }
\ttdefault	cmtt	\ttfamily, \texttt{ }
\scdefault	cmss	\sffamily, \textsf{ }
\seriesdefault	m	\normalfont, \textnormal{ }
\mddefault	m	\mdseries, \textmd{ }
\bfdefault	bx	\bfseries, \textbf{ }

The listed variables might be overriden with \renewcommand{\variable}{\newvalue}, eg.:

Command	Effect
\renewcommand{\rmdefault}{\pbk}	sets the default roman font to *Bookman* (pbk)
\renewcommand{\familydefault}{\sfdefault}	sets the general default font to the default sans-serif font

11.1.2 Setting fonts with packages

Package	Text font	Sans	Typewriter	Math
none	CM Roman	CM SansSerif	CM Typewriter	CM Roman
`mathpazo`	Palatino			≈Palatino
`mathptmx`	Times			≈Times
`helvet`		Helvetica		
`avant`		Avant Garde		
`courier`			Courier	
`chancery`	Zapf Chancery			
`bookman`	Bookman	Avant Garde	Courier	
`newcent`	New Century Schoolbook	Avant Garde	Courier	
`charter`	Charter			

11.1.3 Common font family names

Abbreviation	Font name
`cmr`	CM Roman
`ppl`	Palatino
`ptm`	Times Roman
`pzc`	Zapf Chancery
`pbk`	Bookman
`phv`	Helvetica

11.2 Size

Command	Effect
`\tiny`	tiny font (5 pt)
`\scriptsize`	very small font (7 pt)
`\footnotesize`	quite small font (8 pt)
`\small`	small font (9 pt)
`\normalsize`	normal font (10 pt)
`\large`	large font (12 pt)
`\Large`	larger font (14.4 pt)
`\LARGE`	very large font (17.28 pt)
`\huge`	huge font (20.74 pt)
`\Huge`	largest font (24.88 pt)

11.3 Color

Command	Effect
`\color{color}`	sets the color
`\normalcolor`	resets the color
`\textcolor{color}{text}`	sets the color of the specified text
`\pagecolor{color}`	sets the page background color

11.4 Special characters

11.4.1 Quotation marks

Notation/command	Description	
`\glqq`	German left quote (double)	„
`\grqq`	German right quote (double)	“
`\glq`	German left quote (single)	‚
`\grq`	German right quote (single)	‘
`\frqq`	French left quote (double)	»
`\flqq`	German right quote (double)	«
`\frq`	French left quote (single)	›
`\flq`	German right quote (single)	‹
` `` `	English left quotes (double)	“
`''`	English right quotes (double)	”
`"``	German left quote (double)	„
`"'`	German right quote (double)	“

Notes

- Short notations for German quotes require German language via `babel` package.
- For escaping quotation marks see 2: Escaping.

11.4.2 Miscellaneous

- with `textcomp` package: `\textcopyright` ©, `\texttrademark` ™, `\textcelsius` ℃, `\texteuro`, . . .
- official €-symbol with `\usepackage[official,right]{eurosym}`: `\euro`, `\EUR{123,45}`
- with `pifont` package: `\ding{sym_num}`, `\Pisymbol{sym_font}{sym_num}`
- using inline math environment: `$ \rightarrow \leftrightarrow $` →↔, see also section 9.3
- see also 2: Escaping

11.5 Sections, paragraphs, . . .

These commands require the `sectsty` package.

Command	Effect
`\allsectionsfont{any_latex_cmd}`	allows to set font family/style for all sections
`\subsectionfont{any_latex_cmd},` `\paragraphfont{any_latex_cmd}, ...`	allows to set font family/style for subsections, paragraphs, . . .

12 Enumerations

Command	Effect
`\begin{itemize} ...\end{itemize}`	defines enumeration block *without* numbering
`\begin{enumeration} ...\end{enumeration}`	defines enumeration block *with* numbering (use of `\label` is possible)
`\begin{description} ...\end{description}`	defines a descriptive enumeration block
`\setlength\itemsep{spacing}`	controls spacing between items
`\item[icon/description]`	starts an item with the specified icon/description in case of `itemize/description`

13 Boxes, frames

Command	Effect
`\fbox{text}`	simple framed box
`\mbox{text}`	simple unframed box
`\framebox[width][alignment]{text}`	framed box with alignment and width (here "`1.5\width`")
`\makebox[width][alignment]{text}`	unframed box with alignment and width (here "`1.5\width`")
`\colorbox{bg_color}{text}`	unframed box with background color
`\colorbox{frame_color}{bg_color}{text}`	framed box with colored background and frame
`\minibox{text}`	unframed box which allows manual line breaks (requires `minibox` package)
`\rule[vertical_offset]{width}{height}`	▬ (invisible) padding (when either `width` or `height` is zero)

13.1 fancybox

These commands require the `fancybox` package.

Command	Effect
`\ovalbox{text}`	oval box
`\Ovalbox{text}`	oval box (thick border)
`\shadowbox{text}`	shadowed box
`\doublebox{text}`	box with double border
`\cornersize{corner_size}`	manipulates the corner size
`\raisebox{raise}{text}`	allows to raise and to lower (negative raise)
`\underline{text}`	underline
`\underbar{text}`	underbar underline and underbar

13.2 Minipages

Allow side by side positioning; can be used withing `float` environment; require the `minipage` package.

Command	Effect
`\begin{minipage}[vert_align]{width} ...\end{minipage}`	defines minipage

Vertical alignment either `t`, `c` or `b` for top, center or bottom subsubsection

Width use eg. `0.5 \textwidth` for 50 % of the available with

14 Graphics

With PDFLaTeX *.pdf, *.jpg and *.png files can be included with `\includegraphics[options]{image}`. For floating graphics see 7: Floating environments.

Option	Note
`viewport=x1 y2 x2 y2, clip`	cropping (in $\frac{1}{72}$ inch, relative to bottom left corner)
`scale=`	scales the image by the specified factor
`width=, height=`	specifies the size
`angle=`	specifies the rotation angle (counterclockwise)

14.1 Annotations

Graphics can be annotated using the `overpic` environment of the `overpic` package.

Listing 1: Annotation example

```
\begin{overpic}[tics=10,height=7cm]{robot}
    \put(80 ,32){detector}
    \put(87 ,36){\vector(-1,4){1.5}}
    \put(50 ,18){source}
    \put(77 ,19){\vector(1,0){7}}
```

```
    \put(15 ,50){valve}
    \put(30 ,50){\vector(1,-1){5}}
    \put(19 ,13){{\small A1}}
\end{overpic}
```

14.2 Drawings

Drawings can be created with the `picture` environment. The package `tikz` provides extended features. Functions can be drawn with GNU Plot.

15 Tables

For basic tables no packages need to be included. However the packages `tabularx`, `array` and `longtable` provide extended features.

Command	Effect
`\begin{tabular}[position]{column_declarations}` `...\end{tabular}`	defines a table
`\begin{tabular*}{width}[position]{column_declarations}` `...\end{tabular*}`	defines a table with the specified width
`\begin{array}[position]{column_declarations}` `...\end{array*}`	defines a table (for formulas)
`\begin{tabbing}` `...\end{tabbing}`	defines a tabulator-based table
`\begin{longtable}[position]{column_declarations}` `...\end{longtable}`	defines a table which is able to expand multiple pages (can not be used in a floating environment)
`\listoftables`	prints the list of tables
`\multicolumn{count}{position}{content}`	allows content to span multiple columns
`\cline{start_col-end_col}`	inserts a horizontal line which spans multiple columns

15.1 Column definitions

Syntax	Description
`l, r, c`	specifies the alignment
`p{width}`	specifies width
`|`	defines vertical line between columns
`@{col_divider}`	sets the column divider
`*{count}{definition}`	inserts `definition` `count` times

Listing 2: Example table

```
\begin{tabular}{|lcr|}
    \hline
    Color & Shape & Number \\
    red & rect & 100 \\
    blue & circle & 99 \\
    \hline
\end{tabular}
```

Listing 3: Example tabulator-based table

```
\begin{tabbing}
    Distributions: \ \= Column 1 \= Column 2 XX\kill \\
    Distributions:   \> Name \= Packaging system \\
                     \> Arch Linux \= pacman \\
                     \> Debian \= APT
\end{tabbing}
```

15.2 Floating tables

Command	Effect
`\begin{table} ...\end{table}`	defines a floating environment for embedding the actual table
`\centering`	sets alignment of the `table` environment to center
`\caption`	specifies the caption of the floating table
`\label`	defines an anchor referring to the floating table

Remarks The `table` environment defines only the floating element. The actual table is still defined using the `tabular` environment.

16 Including source code

The `lstlisting` environment and assoiciated commands require the `listings` package.

Command	Effect
`\begin{verbatim} ... \end{verbatim}`	ignores LaTeX syntax, sets typewriter font
`\begin{lstlisting}[options] ... \end{lstlisting}`	advanced version of verbatim, see 16.1: lstlisting options
`\lstinputlisting[options]{file}`	same as `lstlisting` environment, but allows including an external file

16.1 lstlisting options

Option	Example/values	Description
`caption=`	`{Some C++ code}`	caption (with number)
`label=`	`{anchor_name}`	defines an anchor, see 3.1: Labels/anchors and references
`title=`	`{More C++ code}`	caption (without number)
`language=`	`{[Visual]C++}/{[LaTeX]tex}`	programming language
`breaklines=`	`true/false`	enables/disables line breaks
`basicstyle=`	`{\ttfamily\footnotesize}`	defines the basic style
`keywordstyle=`	`{\color{blue}}`	sets the style of keywords
`commentstyle=`	`{\color{green}}`	sets the style of comments
`stringstyle=`	`{\color{brown}}`	sets the style of string literal
`backgroundcolor=`	`{\color{yellow}}`	sets the background color
`frame=`	`none/leftline/topline/ bottomline/lines/shadowbox`	specifies the appearance of the frame
`numbers=`	`left/right`	enables line numbers
`inputencoding=`	`latin1`	specifies the input encoding
`float=`	see 7.1: Preferred position	enables floating

17 Biblography

17.1 Manual bibliography

Command	Effect
`\begin{thebibliography}{abbr_length} ...\end{thebibliography}`	defines a manual bibliography
`\bibitem{key} title of book, author ...`	starts an item

17.2 Automatically generated bibliography

Command	Effect
`\biblographystyle{style_file}`	sets the bibliography layout, see 17.2.1: Styles
`\bibliography{bib_file1, bib_file2, ...}`	makes the bibliography
`\cite[text]{key}`	reference to biblography entry with *text*
`\nocite{key1, key2}`	ensures the specified entries occur in the biblography without producing a reference
`\nocite{*}`	ensures all entries occur in the biblography without producing any references

17.2.1 Styles

Name	Note
`plain`	alphabetical order, numeric marks
`unsrt`	sorted by the occurrence of references, numeric marks
`alpha`	alphabetical order, marks with author and year
`natdin`	alphabetical order, marks with full author name and year according DIN 1505 part 2 (requires `natbib` package)

17.2.2 *.bib-File example

```
@book{ entry_id,
  author = {Goossens, Michel and Mittelbach, Frank},
  title = {Der LaTeX-Begleiter},
  publisher = {Pearson Studium},
  address = {M{\"{u}}nchen},
  year = {2005},

  ...
}
```

```
@article{ entry_id,
  author = {Neubauer, Marion},
  title = {Mikrotypographie-{R}egeln, {T}eil 1},
  journal = {Die {T}eXnische {K}om{\"{o}}die},
  number = {4},
  pages = {23--40},
  year = {1996},
  ...
}
```

Other entry classes `@booklet`, `@conference`, `@manual`, `@masterthesis`, `@misc`, `@string{abbreviation_id = "Text"}`, ...

17.2.3 Compilation steps

1. `pdflatex`: generates *.aux-file (for `\cite`-commands)
2. `bibtex`: generates *.bbl-file (from *.aux- and *.bib-file)
3. `pdflatex`: can now generate bibliography (from *.bbl-file)
4. `pdflatex`: can now generate references to bibliography

18 Index

These commands require the `makeidx` package and `\makeindex` in the header.

Command	Effect
`\printindex`	prints the index
`\index{index_entry}`	defines an index entry, see 18.1: Syntax

18.1 Syntax

Symbol	Effect
`@`	divides *key* and *entry*, eg. `\index{key@entry}` (*entry* is sorted by *key*)
`!`	divides main entry and secondary entry, eg. `\index{main_entry!sec_entry}`
`|`	starts command which is applied to page number, eg. `\index{important|textbf}`
`|(...|)`	starts/ends page range, eg. `\index{entry|(}`. . . `\index{entry|)}` → key, 7-9
`"`	escape character, eg. `\index{"@}` → @, 5

18.2 Compilation steps

1. `pdflatex`: generates *.idx-file (for `\index`-commands)
2. `makeindex`: generates *.ind-file (from *.idx- and *.ist-file)
3. `pdflatex`: can now generate index

19 Nomenclature/symbol table

These commands require the `nomencl` package and `\makenomenclature` in the header.

Command	Effect
`\printnomenclature`	prints the nomenclature
`\nomenclature{symbol}{description}`	defines a symbol

19.1 Compilation steps

1. `pdflatex`: reads `\nomenclature`-commands
2. `nomencl`: generates *.nls and *.ilg files
3. `pdflatex`: can print nomenclature

20 Customization

20.1 Commands

Command	Effect
`\newcommand{\cmd_name}[arg_count]{cmd_content}`	defines a new command
`\renewcommand{\cmd_name}[arg_count]{cmd_content}`	redefines an existing command

20.2 Environments

Command	Effect
`\newenvironment{\env_name}{begin_env_code}{end_env_code}`	defines a new environment

20.3 Counter

Command	Effect
`\newcounter{counter_name}`	defines a new counter which is initialized with 0
`\arabic{counter_name}`	prints the counter value with Arabic digits
`\roman{counter_name}`	prints the counter value with Roman digits
`\value{counter_name}`	returns the counter value
`\setcounter{counter_name}{value}`	assigns the counter to the specified value
`\addtocounter{counter_name}{value}`	increments the counter by the specified value
`\stepcounter{counter_name}`	increments the counter by one

20.4 Lengths

Command	Effect
`\setlength{\length_name}{length}`	defines a new length
`\addtolength{\length_name}{length_increment}`	increments the specified length
`\settowidth{\length_name}{some_text}`	defines a new length with the length of the specified text

20.5 Comparsion operations

Requires the `ifthen` package.

Usage `\ifthenelse{condition}{"true" branch}{"false" branch}`,
eg. `\ifthenelse{\value{c1} > \value{c2}}{$c1 > c2$}{$c1 \le c2$}`

Loops `\whiledo{condition}{code}`

20.6 Document classes

Create *.cls file, eg.

```
\ProvidesClass{myclass}[desc]
\LoadClassWithOptions[a4paper,ngerman,twoside]{article}
\RequiredPackage[ansinew]{inputenc}
\RequiredPackage[T1]{fontenc}
\RequiredPackage[ngerman]{babel}
\RequiredPackage{xcolor,graphics}
```

20.7 Packages

Create *.sty file, eg.

```
\ProvidesPackage{mypackage}[desc]
\newenvironment{...}{...}{...}
\newcommand{...}[...]{...}
...
```

21 Koma-Script

Bundles various classes and packages for European layout.

21.1 Classes

Default class	Koma-Script class
`article`	`scrartcl`
`report`	`scrreprt`
`book`	`scrbook`
`letter`	`scrlettr`

21.2 Packages

Packages	Provides
`\scrdate`	`\todaysname`, `\nameday{name}`
`\scrtime`	`\thistime[separator]`

22 PDF tweaks

The following commands are PDF specific and require the `hyperref` package which should be loaded as last package.

22.1 PDF specific configuration (example)

```
1 \hypersetup{%
2     pdfauthor={The author},
```

```
    pdftitle={The title},
    pdfsubject={The subject},
    pdfkeywords={keyword1, keyword2, ...},
    pdfstartview={FitV},
    pdfview={FitH},
    pdfpagemode={FullScreen},
    colorlinks={true/false},
    urlcolor={some\_color},
    backref={true/false}
}
```

22.2 Links and bookmarks

Command	Effect
`\href{url}{text}`	makes a link with the specified text and url
`\url{url}`	make a link with the specified url which is also used as link text
`\pdfbookmark[level]{text}{anchor_id}`	inserts a PDF bookmark

Note Escaping of # and ~ is not necessary.

22.3 PDF inclusion

Can be done with the `\includepdf[options]{document_name}` command which requires the `pdfpages` package.

Option	Specifies
`pages`	the pages to be included, eg. `pages={2-4; 10}`
`nup`	the number of (included) pages on one page, eg. `nup=`*xxy*
`landscape`	whether landscape layout is used (`true` or `false`)

23 Presentations

- document class: `beamer`
- each page is embedded in `\frame{content}` or `frame` environment
- presentation structure is defined using `\section[long_heading]{TOC_heading}`, `\subsection[]{}`...

Command	Effect
`\frame`	wraps a page
`\frametitle{title}`	sets the frame title
`\titlepage`	makes the title page

24 Further information

Full LaTeX documentation is available at the CTAN (Comprehensive TeX Archive Network) website.