
Typesetting with T_EX / L^AT_EX

Part VI: BIBT_EX and MakeIndex

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Overview

- Part I: basic components and essential \LaTeX
- Part II: formatting and layout
- Part III: figures and tables
- Part IV: basic mathematics and $\text{AMS}\text{\LaTeX}$
- Part V: $\text{PDF}\text{\LaTeX}$ and slides
- **Part VI**: $\text{BIB}\text{\TeX}$ and MakeIndex
- Part VII: useful things...

BIB_TE_X



Bibliographies

- \LaTeX provides a mechanism for citations:
 - Symbolic citations to references in a bibliography
 - A special bibliography environment to keep the bibliography itself
 - Similar to label / reference system for counters
- \BIBTeX is a tool to maintain bibliographies
 - References are kept in a database
 - \BIBTeX automatically extracts and adds cited references
 - Formatting of references done automatically

Citations

- To cite a references in the bibliography:

```
\cite[text]{key}
```

- **key** is label of reference
 - **text** is additional text printed with reference
 - More than one key can be listed, separated by commas
- For a `\cite` command to replace three or more references by ranges use package `cite`
 - Reference [3,4,5,8,7,6] becomes [3-5,8,7,6]
 - To sort reference lists use package `citesort`
 - Reference [3,4,5,8,7,6] becomes [3-8]

thebibliography Environment

➤ Reference provided by thebibliography environment:

```
\begin{thebibliography}
\bibitem[label]{Key} M.~Goossens,
F.~Mittelbach. \emph{The \LaTeX\
companion}.
...
\end{thebibliography}
```

- **key** is used for the `\cite` label
- **label** provides printed label for reference
- Without **label** references are numbered consecutively

➤ Format of references is free (works like a `itemize` environment)

- BIB_TE_X generates the bibliography automatically
 - Can use large databases containing many references
 - Includes only those that are cited in the document
 - Entries are sorted
 - Entries are consistently formatted (provided the database is consistent)



Bibliography Database

➤ Bibliography databases (.bib) entries:

```
@entry-type{key,  
  field1 = "text",  
  ...  
  fieldn = "text"  
}
```

```
@book{eijkhout91,  
  author = "Victor Eijkhout",  
  title = "\TeX\ by Topic, a \TeX{}nicians  
Reference",  
  publisher = "Addison-Wesley'',  
  year = "1991"  
}
```


Bibliography Entry Types

- Many different entry types in bibliography
 - Essentially defined by a bibliography style file
- Standard entries:
 - `book`, `article`, `proceedings`, `inproceedings`,
`incollection`, `inbook`, `booklet`, `phdthesis`,
`mastersthesis`, `techreport`, `manual`, `unpublished`,
`misc`
 - See literature for details
- Many support programs available (e.g. emacs bibtex mode which knows about standard entries and fields)

Author Format

➤ Authors should be entered in the following format:

- forenames von surname
- von surname, forenames
- von surname, jr, forenames

```
"Alex Thomas von Neumann"  
"John Christ {Smith Jones}"  
"van de Klee, Mary-Jane"  
"Smith, Jr, Fred Jhon"  
"Maria {\uppercase{d}e La}  
Cruz"  
"Maria De La Cruz" (!)
```

```
A.T. von Neumann  
J.C. Smith Jones  
M.-J. van de Klee  
F.J. Smith, Jr  
M. De La Cruz  
  
M.D.L. Cruz (!)
```

➤ Multiple authors should be split by and:

```
"Goossens, Michel and Rahtz, Sebastian"
```

Database and Bibliography Style Declaration

- Bibliography Style declared in T_EX source:

```
\bibliographystyle{style-name}
```

- Common Styles:

- plain — sorted alphabetically with num. labels
- unsrt — in order of citation with num. labels
- alpha — sorted alphabetically with author/year labels

- Declare bibliography database (multiple separated by comma):

```
\bibliography{name}
```

BIB_TE_X Example

➤ In \LaTeX source filename.tex with database file database.bib:

```
This is the document\dots

\bibliographystyle{plain}
\bibliography{database}
```

➤ To generate the file:

```
> latex filename
> bibtex filename
> latex filename
> latex filename
```

MakeIndex



Indices...

- \LaTeX provides special commands to maintain indices
- General procedure:
 - Mark entries in text
 - \TeX generates unsorted index file
 - Use `makeindex` to sort indices
 - Run \TeX to include sorted index file

Insert Index Markers

➤ Command to set indices:

```
\index{index text}
```

- Creates a index entry for `index text` to the page where `\index` appears (page itself it not changed)

➤ Sub-indices:

```
\index{index1!index0}
```

- Creates `index1` as sub-index of `index0` (more levels possible)

Index Marker Examples

```
On page 3:  \index{dimensions!rule!width!}  
On page 5:  \index{box!parameters}  
On page 9:  \index{dimensions!table}  
On page 12: \index{dimensions!rule!height}  
On page 21: \index{box}  
On page 33: \index{box!dimensions of|see{dimensions}}
```

box, 21

dimension of, see dimensions

parameters, 5

dimensions

rule

height, 12

width, 3

table, 9

Define Index Entry

- Default index entry is defined by argument of `\index`
- To change this provide alternative after `@`:

```
\index{key@label}
```

- Examples:

```
\index{flower@\textbf{flower}}  
\index{delta@$\delta$}  
\index{ninety@XC}
```

δ , 14

flower, 19

XC, 28

- Note that sorting is done according to **key**



Create Index

➤ To create the unsorted index file:

- Include `makeidx` package
- Insert `\makeindex` in preamble
- Insert `\printindex` where index should appear in document
- Run \LaTeX to get unsorted index file

Format Index

- `makeindex` program can be used to generate a formatted index from unsorted index file:

```
> makeindex filename.idx
```

- Generates sorted index `filename.ind`
 - Next run of \LaTeX will include `filename.ind`
- Index file contains a `theindex` environment similar to an `itemize` environment
 - Do not manually edit `filename.ind...`
 - See `makeindex` man-page (`man makeindex`) for options, etc.
 - There are many ways to adjust the index format (index styles), etc. (see literature)