15 Bibliographic Databases

Bibliographic Database is a database where all the useful bibliographic entries can be stored. The information about the various publications is stored in one or more files with the extension `.bib`. For each publication there is a *key* that identifies it, and which may be used in the text document to refer to it. And this is available for all documents with a list of reference in the field. This database is useful for the authors/researchers who are constantly referring to the same publications in most of their works. This database system is possible with the BibTeX program supplied with the LaTeX package.

15.1 The BibTeX program

BibTeX is an auxiliary program to LaTeX that automatically constructs a bibliography for LaTeX document form one or more databases. To use BibTeX, you must include in your LaTeX input file a `\bibliography` command whose argument specifies one or more files that contain the database. For example

```
\bibliography{database1,database2}
```

The above command specifies that the bibliographic entries are obtained from *database1.bib* and *database2.bib*. To use BibTeX, your LaTeX input file must contain a `\bibliographystyle` command. This command specifies the *bibliography style*, which determines the format of the source list. For example, the command

```
\bibliographystyle{plain}
```

specifies that entries should be formatted as specified by the `plain` bibliography style (`plain.bst`). We can put `\bibliographystyle` command anywhere in the document after the `\begin{document}` command.

15.2 BibTeX Style files

plain	Standard BibTeX style. Entries sorted alphabetically with numeric labels.
unsrt	Standard BibTeX style. Similar to plain, but entries are printed in order of citation, rather than sorted. Numeric labels are used.
alpha	Standard BibTeX style. Similar to plain, but the labels of the entries are formed from the author's name and the year of publication.
abbrv	Standard BibTeX style. Similar to plain, but entries are more compact, since first names, month, and journal names are abbreviated.
acm	Alternative BibTeX style, used for the journals of the Association for Computing Machinery. It has the author name (surname and first name) in small caps, and numbers as labels.
apalike	Alternative BibTeX style, used by the journals of the American Psychology Association. It should be used together with the LaTeX apalike package. The bibliography entries are formatted alphabetically, last name first, each entry having a hanging indentation and no label.

Examples of some other style files are:

```
abbrv.bst, abstract.bst, acm.bst,    | jtb.bst, kluwer.bst, named.bst,
agsm.bst, alpha.bst, amsalpha.bst,   | named.sty, natbib.sty, natbib.bst,
authordatei.bst, authordate1-4.sty,  | nature.sty, nature.bst, phcpc.bst,
bbs.bst, cbe.bst, cell.bst,          | phiaea.bst, phjcp.bst, phrmp.bst
dcu.bst, harvard.sty, ieeetr.bst,    | plainyr.bst, siam.bst
```

Various organisations or individuals have developed style files that correspond to the house style of particular journals or editing houses. We can also customise a bibliography style, by making small changes to any of the `.bst` file, or else generate our own using the `makebst` program.

15.2.1   Steps for running BibTeX with LaTeX

(1) Run LaTeX, which generates a list of `\cite` references in its auxiliary file, `.aux`.

(2) Run BibTeX, which reads the auxiliary file, looks up the references in a database (one or more `.bib` files, and then writes a file (the `.bbl` file) containing the formatted references according to the format specified in the style file (the `.bst` file). Warning and error messages are written to the log file (the `.blg` file). It should be noted that BibTeX never reads the original LaTeX source file.

(3) Run LaTeX again, which now reads the `.bbl` reference file.

(4) Run LaTeX a third time, resolving all references

Occasionally the bibliography is to include publications that were *not* referenced in the text. These may be added with the command

```
\nocite{key}
```

given anywhere within the main document. It produces no text at all but simply informs BibTeX that this reference is also to be put into the bibliography. With `\nocite{*}`, *every* entry in all the databases will be included, something that is useful when producing a list of all entries and their keys.

After running BibTeX to make up the .bbl file, it is necessary to process LaTeX *at least twice* to establish both the bibliography and the in-text reference labels. The bibliography will be printed where the `\bibliography` command is issued; it in ifact inputs the .bbl file.

15.3   Creating a bibliographic database

Though bibliographic database creation demands more work than typing up a list of references with the `thebibliography` environment; it has a great advantage that, the entries need to be included in the database only once and are then available for all future publications even if a different bibliography style is demanded in later works, all the information is already on hand in the database for BibTeX to write a new `thebibliography` environment in another format. Given below is a specimen of an entry in bibliographic database:

```
@BOOK{knuth:86a,
  AUTHOR        ="Donald E. Knuth",
  TITLE         ={The \TeX{}book},
  EDITION       ="third"
  PUBLISHER     ="Addison-Wesley",
  ADDRESS       ={Reading, MA},
  YEAR          =1986 }
```

The first word, prefixed @, determines the *entry_type*. The *entry_type* is followed by the reference information for that entry enclosed in curly braces { }. The very first entry is the *key* for the whole reference by which it is referred to in the \cite command. In the above example it is knuth:86a. The actual reference information is then entered in various *fields*, separated from one another by commas. Each *field* consists of a *field_name*, an = sign, with optional spaces on either side, and the *field text*. The *field_names* shows above are AUTHOR, TITLE, PUBLISHER, ADDRESS, and YEAR. The *field text* must be enclosed either in curly braces or in double quotation marks. However, if the text consists solely of a number, as for YEAR above, the braces or quotation marks may be left off.

For each entry type, certain fields are *required*, others are *optional*, and the rest are *ignored*. These are listed with the description of the various entry types below. If a required field is omitted, an error message will occur during the BɪʙTᴇX run. Optional fields will have their information included in the bibliography if they are present, but they need not be there. Ignored fields are useful for including extra information in the database that will not be output, such as comment or an abstract of the paper. Ignored fields might also be ones that are used by other database programs.

The general syntax for entries in the bibliographic database reads

```
@entry_type{key,
 field_name = {field text},
 ....
 field_name = {field text} }
```

The names of the *entry_types* as well as the *field_names* may be written in capitals or lower case letters, or in a combination of both. Thus @BOOK, @book, and @bOOk are all acceptable variations.

The outermost pair of braces for the entire entry may be either curly braces { }, as illustrated, or parentheses ( ). In the latter case, the general syntax reads

```
@entry_type(key, ... ..)
```

However, the *field text* may only be enclosed within curly braces {...} or double quotation marks "..." as shown in the example above.

The following is a list of the standard entry types in alphabetical order, with a brief description of the types of works for which they are applicable, together with the required and optional fields that they take.

@article   Entry for an article from a journal or magazine
required fields   author, title, journal year.
optional fields   volume, number, pages, month, note

@book   Entry for a book with a definite publisher.
required fields   author or editor, title, publisher, year
optional fields   volume or number, series, address, edition, month, note

@booklet   Entry for a printed and bound work without the name of a publisher or sponsoring organisation
required fields   title
optional fields   author, howpublished, address, month, year, note

@conference   Entry for an article in conference proceedings
required fields   author, title, booktitle, year
optional fields   editor, volume or number, series, pages, address, month, organisation, publisher, note

@inbook   Entry for a part (chapter, section, certain pages) of a book
required fields   author or editor, title, chapter and/or pages, publisher, year
optional fields   volume or number, series, type, address, edition, month, note

@incollection   Entry for part of a book that has its own title
required fields   author, title, booktitle, publisher, year
optional fields   editor, volume or number, series, type, chapter, pages, address, edition, month, note

@inproceedings   Entry for an article in conference proceedings
required fields   author, title, booktitle, year
optional fields   editor, volume or number, series, pages, address, month, organisation, publisher, note

@manual   Entry for technical documentation
required fields   title
optional fields   author, organisation, address, edition, month, year, note.

@masterthesis   Entry for a Master's thesis
required fields   author, title, school, year
optional fields   type, address, month, note

@misc   Entry for a work that does not fit under any of the others
required fields   none
optional fields   author, title, howpublished, month, year, note

@phdthesis   Entry for a PhD thesis
required fields   author, title, school, year
optional fields   type, address, month, note

@proceedings   Entry for conference proceedings
required fields   title, year
optional fields   editor, volume or number, series, address, month, organisation, publisher, note

@unpublished   Entry for an unpublished work with an author and title
required fields   author, title, note
optional fields   month, year

15.3.1   Example of a LaTeX file (sample.tex) using bibliographical database (bsample.bib)

```
\documentclass{article}
\pagestyle{empty}
\begin{document}

\section*{Example of Citations of Kind \texttt{plain}}

Citation of a normal book~\cite{Eijkhout:1991} and an edited
book~\cite{Roth:postscript}. Now we cite an article written by a
single~\cite{Felici:1991} and by multiple
authors~\cite{Mittlebatch/Schoepf:1990}. A reference to an
article inside proceedings~\cite{Yannis:1991}.
We refer to a manual~\cite{Dynatext} and a technical
report~\cite{Knuth:WEB}. A citation of an unpublished
work~\cite{EVH:Office}. A reference to a chapter in a
book~\cite{Wood:color} and to a PhD thesis~\cite{Liang:1983}.
An example of multiple
citations~\cite{Eijkhout:1991,Roth:postscript}.
```

```
\bibliographystyle{plain} %% plain.bst
\bibliography{bsample}    %% bsample.bib
\end{document}
```

15.3.2 Procedure for producing References for the above file sample.tex which uses bibliographic data base bsample.bib

```
$ latex sample      %%%%%%%%%%%% 1st run of LaTeX

$ bibtex sample     %%%%%%%%%%%% BibTeX run
                    %%%%%%%%%%%% Then sample.bbl file will
                    %%%%%%%%%%%% be produced

$ latex sample      %%%%%%%%%%%% 2nd run of LaTeX

  If still unresolved citation references

$ latex sample      %%%%%%%%%%%% 3rd run of LaTeX
```