Generating Bibliographies

Petra Harwin

October 29, 2012

Contents

1 A Basic Bibliography

A basic bibliography can be generated by using an environment called `thebibliography`. Its basic syntax is

```
\begin{thebibliography}{sample_label}
entries
\end{thebibliography}
```

The argument `sample_label` should contain the longest label since this is the amount that LaTeX will indent the references at the left hand side of the bibliography. Each entry has the syntax

`\bibitem[label]{key} entry text`

Without the optional argument `label`, `\bibitem` produces a running number in square brackets as the label for the reference in the text. With `label` you can give whatever indicator you wish. The mandatory argument `key` is used to cite the reference.

1.1 The Entries

The entries in \bibitem need to be formatted manually. A variety of text styles are employed here. Their types will depend on your chosen bibliography style. The main styles used are *emphasis*, generated by using {\em emphasis} and **bold**, generated by {\bfseries bold}. The citation in the text itself is made with the command \cite{key}, where key is the reference keyword that appears in the \bibitem command.

If the bibliography contains the text

```
\begin{thebibliography}{JBloggs}
\bibitem[JBloggs]{JB} J. Bloggs,
{\em A Very Long and Complicated Mathematical Paper},
Proc. Royal Soc. Dudley, {\bfseries 2} (2004), 1--2.
\end{thebibliography}
```

then we may cite this reference as follows: "The outstanding work of \cite{JB}". This will produce "The outstanding work of [JBloggs]".

1.2 The output

The results of the thebibliography environment are printed as the bibliography, which is usually at the end of the document. For the document classes book and report the word **Bibliography** appears as a chapter title at the beginning, whereas for article the word **References** is written as a section heading. Our earlier sample bibliography produces

References

[JBloggs] J. Bloggs, *A Very Long and Complicated Mathematical Paper*, Proc. Royal Soc. Dudley, **2** (2004), 1–2.

2 BibTEX

Suppose now that you have a list of references that you use a lot in lots of different papers. Surely there's an easier way than copying and pasting! Indeed there is and I now want to talk about an auxiliary package for TEX called BibTEX. BibTEX automatically constructs a bibliography for a LATEX document by searching one or more databases. To this end a LATEX file must contain the command

\bibliography{database1,database2,...}

at the point in the text where the bibliography is to appear. The argument `database1,database2,...` is a list of names of bibliographic databases that are to be searched. Citations are made in the same way as before.

Creating a bibliographic database might seem like more work than typing up a list of references with the `thebibliography` environment but the great advantage is that the entries only need to be included once and then are available for all future documents, even if a different bibliography style is required in later works.

2.1 Creating a database

Databases are files with a `.bib` extension (not a `.tex` one) and their entries are similar to the example below.

```
@Book{JB,
  author =       {J. Bloggs},
  title =        {The {A}rt of {W}riting {L}ong and
         {C}omplicated {M}athematical {P}apers},
  publisher =    {Smart Publishing},
  year =         {2004},
  address =      {Dudley, England},
}
```

The first word, prefixed by `@`, 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 and is used to cite the reference using the `\cite` command. A key may be any combination of letters, numbers and symbols *except* commas. The actual reference information is then entered in the various fields.

2.1.1 The author and editor fields

For the majority of fields you simply type in what you want to appear, but there are four exceptions – the author and editor fields and the title and booktitle fields.

In the author and editor fields names may be entered in one of two ways

{Surname, Forenames} or {Forenames Surname}

BibTEX treats them equivalently so {John George Harrison} and {Harrison, John George} are equivalent for Mr. J.G. Harrison. However, if a person has a double surname without a separating hyphen then either the second form must be used or the double name must be enclosed in a { } pair:

{San Martino, Maria} or {Maria {San Martino}}
for Ms. M. San Martino.

Auxiliary words to a surname that are not capitalised can be entered in either form:

{Richard von Mannheim} or {von Mannheim, Richard}
{Walter de la Marie} or {de la Marie, Walter}

Multiple names should be separated with the word "and" no matter how many authors are in the list. This is because BibTEX treats a comma as a special character. If the author list is too long to type in all the names it may be terminated with "and others". This will be converted to the appropriate form of `et al.` for the style of bibliography chosen. (Just typing "et al." won't work because BibTEX will think it is a name.)

Anything enclosed in a { } pair will be treated as a single item. This is useful when a name you wish to enter contains a comma or the word "and". For example, to get BibTEX to properly process the name "Harvey and Sons, Ltd" we need to enclose the entire name in a { } pair:

{{Harvey and Sons, Ltd}}

If the name contains Jr or some other addition then it must be entered as

{Surname, Junior, Forenames}

For example, "Henry Ford Jr" should be typeset as

{Ford, Jr, Henry}

If this is not done then BibTEX may confuse Jr with either the surname or the forenames.

Within a name, accents formed with a backslash command must be enclosed in a { } pair and the backslash must be the first character after the opening brace. The backslash must not be any deeper inside the { } pair else the labelling and sorting will not function correctly in some bibliography styles. To produce "Kurt Gödel" we must type

{Kurt G{\"o}del}

2.1.2 The title and booktitle fields

Capitalisation within this field is decided by the bibliography style chosen, however, a title should always be typed as it appears. To override the decisions made by the bibliography style you should enclose parts that should remain unchanged within curly braces. For example, we do not want the word "Belgium" to ever have a lowercase B in the title "The towns and villages of Belgium" so we should typeset this as

{The towns and villages of {B}elgium}

For more detailed information on these fields refer to Mittlebach and Goossens pages 766–769 or Kopka and Daly Appendix B.

2.1.3 Comments and abbreviations in BibTEX

The `%` character is not a comment character inside `.bib` database files. Instead anything outside an entry is considered a comment unless it contains the `@` character (which would be misinterpreted as the start of a new entry).

You may define abbreviations for commonly used things as follows:

```
@string{abbr_name={text}},.
```

So if you type `@string{PRSD={Proc. Royal Soc. Dudley}}`, then the following are equivalent

```
journal=PRSD,
journal={Proc. Royal Soc. Dudley},
```

Note: braces are omitted when using an abbreviation.

Abbreviations must be defined before they are used so it's a good idea to put all `@string` commands at the beginning of the `.bib` file.

2.2 Using emacs to create a database

It is easy to create a database using emacs's BibTEX mode. To enter this mode, create a blank file in emacs called `mybibliography.bib` and emacs will change mode automatically.

To get different templates, go to the menu labelled "Entry-Types" and you will see a list of all the possible entry types. Simply select one from the list and it will come up with a template for that entry. Now it is almost a matter of just filling in the gaps, but there is one thing to note first. Since emacs doesn't know exactly what fields you are going to need for your particular article or book, emacs just includes all of them. However, it prefixes optional fields by `OPT` and fields you have a choice between by `ALT`. To get BibTEX to recognise these as valid fields you must remove the `OPT` or `ALT`. For example, this is what emacs produces if you select the entry type "book"

```
@Book{,
  ALTauthor =     {},
  ALTeditor =     {},
  title =         {},
  publisher =     {},
  year =          {},
  OPTkey =        {},
  OPTvolume =     {},
  OPTnumber =     {},
  OPTseries =     {},
  OPTaddress =    {},
  OPTedition =    {},
```

```
  OPTmonth =      {},
  OPTnote =       {},
  OPTannote =     {}
}
```

We would need to remove the `ALT` from either the `author` or `editor` field in order for it to be recognised by BibTEX.

Here are two useful shortcuts for navigating in emacs's BibTEX mode.

- `tab` will move you inside a field and a helpful message will appear in the mini-buffer to tell you what to enter in that field;
- `ctrl-c ctrl-o` will automatically remove `OPT` or `ALT` from that field.

2.3 Bibliography Styles

There are many styles in which you could write your bibliography and BibTEX knows about most of them. The style is specified by putting

\bibliographystyle{known_style}

just before the \bibliography command. Here are some examples

`plain` The entries in the bibliography are ordered alphabetically; each is assigned a running number in square brackets as the in-text reference marker, printed where the \cite commands are issued.

`unsrt` The entries are ordered according to their first reference by the \cite and \nocite commands. The markings and listings are otherwise the same as for `plain`.

`alpha` The ordering in the bibliography is the same as for `plain` but the markers are an abbreviation of the author's name plus the year of publication. A reference to Bloggs (2004) would appear as [Blo04].

`abbrv` The ordering and marking are the same as for `plain`, but the bibliographic listing is shortened by abbreviating first names, months and some journal names.

There are also more complicated ones (like the one I used for my thesis: `amsplain`), but I'll leave you to find one that you're comfortable with. The point is that you don't have to re-write your whole bibliography to change its style, as you would have to if you used the `thebibliography` environment. It can all be done by changing *one* word.

BibTEX is clever and will only list the entries you cite in the bibliography unless you tell it otherwise by using the \nocite{key} command. This will print the reference `key` in the bibliography even though it is not cited in the text.

2.4 The *TEX Loop

Having constructed a database file with BibTEX and told LATEX about the bibliography style, you need to put all the information together. In order to create the bibliography correctly, it is necessary to compile the LATEX document via:

- `latex myfile.tex`
- `bibtex myfile.aux`
- `latex myfile.tex`
- `latex myfile.tex`

This is to do with the way LATEX processes the information from within the document to produce the references, equation numbering and formatting. The principle is to initially run `latex` and `bibtex`, then to run `latex` until there are no further messages telling you to process the document again.