A BibTeX Guide via Examples

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Abstract

This document describes how to modify citation and bibliography styles in the body text, how to create a bibliography style file, and how to modify the bibliography style file.

1 Introduction

There are two methods for adding bibliography at the end of your LaTeX documents. The first method is to use thebibliography environment as shown below:

```
\begin{thebibliography}{99}
 \bibitem{knuth84} Knuth, D.E. \emph{The TEXbook}, Addison-Wesley, Reading,
 Massachusetts, second edition, 1984,
\end{thebibliography}
```

Reference entries are added using `\bibitem{key}` and are called via `\cite{key}` in the body text. You can change the bibliography style by formatting the `bibitem` entry. Even though this is a convenient way to handle bibliography, there are two main problems. You have to format each bibliography item and have to reformat it when you are required to change the bibliography style. Thus, this method is good for short LaTeX documents.

The second method is to use BibTeX. In this case you need two files: bibliography style file (bst file) and bibliography database file (bib file). In your LaTeX source file, you have to add the following two lines for bibliography:

```
\bibliographystyle{unsrt} % Bibliography style file, unsrt.bst
\bibliography{moga}        % Bibliography database file, moga.bib
```

When you type `bibtex` at the command prompt, the bib file is formatted in accordance with the predefined rules in the bst file. The resulting file is a bbl file that is referenced by your LaTeX source file. So the general compile sequence is: `latex` → `bibtex` → `latex`.

Once you have a correct `bst` file, this method is good for writing long documents such as journal papers, reports, books, and your dissertation. You can find lots of bibliography style files in the /texmf/bibtex/bst directory and see the BibTeX Style Examples.

If you are lucky, you may find the bibliography style file from your university or the publisher. Now the problem is how to crteate/modify a `bst` file if you cannot find a right one and are strictly required to follow the citation and bibliography styles by the publisher. For example:

- How can we change [1] in the body citation to (1), (Kim, 2000), Kim (2000), [1], or whatever the publisher wants? ⇒ *Citation style*.
- How can we change [1,2,3,4,12,14,13,7] in the body citation to [1-4,7,12-14] ? ⇒ *Citation style*.
- How can we change [1] in the bibliography list to none, 1., 1), or whatever the publisher wants? ⇒ *Bibliography style*.
- How can we change Kim, A.B., Lee, C.D., and Park, E.F. to AB Kim, CD Lee, EF Park, AB Kim, CD Lee, and EF Park (w/ and), KIM, A.B., LEE, C.D., and PARK, E.F., Kim, Ava Bell, Lee, Cleo Dave, and Park, Elvis Frank, or whatever you are required? ⇒ *Bibliography style*.

- How can we change journal title styles (italic or normal?), volume (bold, presence of vol., style of vol., ...), number, page, and other styles (such as location of the publisher name and its address)? ⇒ *Bibliography style*.

The main focus of this article is how to change citation and bibliography styles in BibTeX. Section 2 shows one example of citation and bibliography styles required. Section 3 describes how to change citation styles in the body text while Sections 4 and 5 present how to create and modify bibliography style files to meet the given bibliography styles. Finally, Section 6 provides some useful tips about citation and bibliography styles. Enjoy !

2   Example

Suppose that you are submitting a journal paper and the publisher requires the following citation and bibliography styles:

- **Citation style:** Cite references in text by number in parentheses, in order of appearance.
- **Bibliography style:** Do not use italics or underscoring. List all known coauthors. For more specific styles, see the following examples.

  1. AW Warner, DL White, WA Bonner. Real-time Fourier transformation via acousto-optics. J Appl Phys 43:4489-4493, **1972**. *(for journal papers)*
  2. D Dzombak. Elements of Power Systems Analysis. 3rd ed. New York: McGraw-Hill, 1975, pp. 125-134. *(for books)*
  3. KJ Kim, UM Diwekar, Solvent selection under uncertainty. In: GV Recklitis, ed. Clean Solvents Design. New York: Marcel Dekker, 2002, pp.169-174. *(for book chapters)*
  4. S Sorensen, S Skogestad, Multi-vessel batch columns. Proceedings of Advances in Batch Distillation, Pittsburgh, P.A. 2002, pp. 270-282. *(for proceedings)*

Some difficult parts of this style are:

- Pure first name initial (no periods) + Last name (e.g., KJ Kim).
- Periods after the author field and journal, book, book chapter, and meeting titles. Commas elsewhere.
- Year after page numbers in journals while year before page numbers in books, book chapters, and meetings (if any).
- Bold-faced year in journals but no bold-faced year for others.
- 'In: ' in book chapters but no 'In: ' in proceedings.

In this case the citation style is quite easy to change and is described in the next section.

3   Citation Styles

The **natbib** package is strongly recommended for modifying citation styles. This package, developed by Patrick W. Daly[1], provides high degree of freedom for citation styles. The following table summarizes most of the options that this package provides.

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[1]One of the authors of *A Guide to LaTeX: Document Preparation for Beginners and Advanced Users.*

Options	Function
round	round parentheses (default)
square	square brackets
curly	curly braces
angle	angle brackets
colon	colon between multiple citations (default)
comma	comma between multiple citations
authoryear	authoryear citations (default)
numbers	numerical citations
super	superscripted numerical citations, as in Nature
sort	sorts multiple citations in accordance with the list of references
sort&compress	sorts and compresses if possible
sectionbib	redefines thebibliography to issue \section* instead of \chapter*

Many of the above options can be invoked using `\bibpunct{}{}{}{}{}{}` in the preamble. The six mandatory arguments are:

1. opening bracket: '(', '[', '{', or '<'
2. closing bracket: ')', ']', '}', or '>'
3. separator between multiple citations: ';' or ','
4. citation style: 'n' for numerical style, 's' for numerical superscript style, or 'a' for author–year style
5. punctuation between the author names and the year
6. punctuation between years or numbers when common author lists are suppressed: ',' or ';'

So the following two settings generate the same citation styles

```
\usepackage[sort&compress]{natbib}
\bibpunct{[}{]}{,}{n}{}{;}
.... equals ....
\usepackage[square,comma,numbers,sort&compress]{natbib}
```

For superscript citation style as in *Nature* the following code is enough.

```
\usepackage[super,sort&compress]{natbib}
```

The reference can be called using \cite, \citet, or \citep commands. For the number citation mode,

`\cite{jon90}`	$\implies$	[21]
`\citet{jon90}`	$\implies$	Jones et al. [21]
`\citep{jon90}`	$\implies$	[21]

For the author–year citation mode,

`\cite{jon90}`	$\implies$	Jones et al. (1990)
`\citet{jon90}`	$\implies$	Jones et al. (1990)
`\citet[Chap.2]{jon90}`	$\implies$	Jones et al. (1990, Chap. 2)
`\citet*{jon90}`	$\implies$	Jones, Baker, and Williams (1990)
`\citep{jon90}`	$\implies$	(Jones et al., 1990)
`\citep*{jon90}`	$\implies$	(Jones, Baker, and Williams, 1990)

4 Making a `bst` File

To create a `bst` file, the **custom-bib** package, also developed by Patrick W. Daly, is the best solution. Download `makebst.ins`, `makebst.dtx`, and `merlin.mbs` from CTAN. The `merlin.mbs` file is a master bibliography style file, and a `bst` file is extracted from this `mbs` file under the given options that you will choose now.

1. Type `latex makebst.ins` in the command mode. This will generate `makebst.tex` and `makebst.drv`.
2. Type `latex makebst` to create a `bst` file. You will be asked a lot of questions regarding the bibliography style options. If you are not sure about the questions, just select the default value (*). Some important style questions are given below in order of appearance. *Remember that we want to stick on the bibliography styles described in Section 2. Also note that there is no way to go back and correct an error during this job.*[2]

   (a) The first question that you will meet is `Do you want a description of the usage?` ⇒ yes.
   (b) `Enter the name of the MASTER file` ⇒ default.
   (c) `Name of the final OUTPUT .bst file?` ⇒ type your `.bst` file name (here, `imsi`).
   (d) `Do you want verbose comments?` ⇒ yes.
   (e) `<<STYLE OF CITATIONS:` ⇒ `(a) Author-year with some non-standard interface`.
   (f) `<<AUTHOR-YEAR SUPPORT SYSTEM` ⇒ `Natbib for use with ˜`.
   (g) `<<ORDERING OF REFERENCES` ⇒ `(c) Citation order (unsorted ...)`.
   (h) `<<AUTHOR NAMES` ⇒ `(x) Surname + pure initials (Smith JF)`. Remember that the style `JF Smith` is not provided. We will modify this later!
   (i) `<<DATE POSITION` ⇒ `(*) Date at end`. Remember that we need year after page numbers in journals but year before page numbers in books, book chapters, and meetings.
   (j) `<<JOURNAL NAMES` ⇒ `(x) Dottles journal names as 'Phys Rev'`. This is required by the book publisher in Section 2.
   (k) `<<VOLUME PUNCTUATION` ⇒ `(*) Volume with colon as vol(num):ppp`.
   (l) `<<JOURNAL NAME PUNCTUATION` ⇒ `(x) Space after journal name`. This is required by the book publisher in Section 2.
   (m) `<<PUBLISHER POSITION` ⇒ `(e) Publisher after edition`.
   (n) `<<PUNCTUATION BETWEEN SECTIONS` ⇒ `(t) Period after titles of articles, books, etc else commas`. We need a period after the author field (e.g., `JF Smith, KJ Kim. ˜`).
   (o) `<<PUNCTUATION AFTER 'IN'` ⇒ `(c) Colon after 'in' (as 'In: ..')`. But we do not need `In:` in meetings (i.e., in collections and in proceedings).
   (p) `Finished! Batch job written to file 'imsi.dbj' Shall I now run this batch job? <NO>` ⇒ If you say `yes`, it creates your `.bst` file.

   All done! If you want to change some options that you have made, open the `dbj` (document batch job ?) file.[3] The questions are in CAPITAL LETTERS, and the options that you have made are uncommented in the first column. Comment out the wrong choice by putting `%` in the first column,

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[2]But you can correct it later.

[3]This is also an ASCII file. This manual editing is appropriate only when you made a wrong *independent* choice. For example, you may not select author-number style options under the number citation system selected in the Step-(e) in Section 4.

and uncomment the choice that you want to select by removing %. Then type `latex imsi.dbj`, resulting in a new `imsi.bst` file.

5 Modifying Bibliography Style Files

Of course the `custom-bib` package may not guarantee all the styles that you are required. In this case some modifications to satisfy the requirement are needed.

The `imsi.bst` file generated in the previous section produces the reference like this:

> [12] Kim KJ, Urmila UM, Solvent selection under uncertainty. In: Proceedings of Clean Solvents Symposium, Pittsburgh, 1980, pp. 120-125.

> [13] Robinson C, Elements of Fractional Distillation. New York: McGraw-Hill, forth ed., 1950.

Due to my poor knowledge about the language (postfix stack language) used in a `bst` file, I could only provide minimal hacking tips for the given example. For more information read `btxhak.dvi` and `btxbst.doc` in the document repository of your TeX file system.

5.1 List Number Style

We want to change the reference numbering system from [12] to 12. This can be done in the preamble by putting the following code:

```
\makeatletter                          % Reference list option change
 \renewcommand\@biblabel[1]{#1.}        %   from [1] to 1.
\makeatother                            %
```

The option `#1.` can be anything that you want to change. For example, #1). creates "1)." in bibliography. If empty in the {}, then no labels are printed in the bibliography.

5.2 Author Name Style

We want to switch the order of surname and first name. Open the `imsi.bst` file. Go down to find the FUNCTION {`format.names`} code. You will see a line similar to "{vv~}{ll}{ f{}}{ jj}". The letter vv is the von part (e.g., von Neumann), ll is the last name part, ff is the first name part, and jj is the junior part. A double letter (e.g., ll) takes full name while a singe letter (e.g., f) abbreviates full name. Thus the current option creates like "Robinson C" since there is no von and junior parts. So in order to switch, just change the order like this "{f{}~}{vv~}{ll}{ jj}".

5.3 Period Style

We want to put '.' after the author field. Go down to find the FUNCTION {`article`} code. Below the `author format.key output` line, insert a `new.sentence` line. According to the Step (n) in Section 4, <<PUNCTUATION BETWEEN SECTIONS in Section 4, this insertion will put period at the end of the author field.

5.4 Presence of In:

We want to remove 'In:...' in proceedings and meetings. Go down to the FUNCTION {`incollection`} code. At the line `format.in.ed.booktitle "booktitle" output.check`, change to `format.booktitle "booktitle" output.check` (i.e., remove .in.ed). Do the same thing for FUNCTION {`inproceedings`}.

5.5 Edition Style

We want to move edition after book tittle. Go to the FUNCTION {book} code. Move the format.edition output line to just above the format.number.series output line.

5.6 Year Style

We want bold-faced years only in journals. First define the following bolden function for bold face:

```
FUNCTION {bolden}
{ duplicate$ empty$
    { pop$ "" }
    { "{\bf " swap$ * "}" * }
  if$
}
```

Go down the page and find "article" function and add bolden to the following line as shown below:

```
FUNCTION {article}
....
    format.date "year" output.check bolden % bolden is added!
```

6 Useful Tips[4]

Question: How can I change the bibliography heading title?
Answer: See the following examples:

```
For book-classes: \renewcommand\bibname{your bibliography title}
For article-classes: \renewcommand\refname{your bibliography title}
```

Question: I have two bibliography entries that BibTEX insists on putting in the wrong order! These entries are identical except for volume:

L. Dornhoff, Group Representation Theory, vol. B, Marcel-Dekker, NY, 1971
L. Dornhoff, Group Representation Theory, vol. A, Marcel-Dekker, NY, 1971

Surly Volume A should precede Volume B, but BibTEX insists on listing them backwards!
Answer: BibTEX sorts the items in the bib file based on author–year–title orders. But in some cases where the same author publishes several papers in the same year BibTEX cannot properly sort the items.

Add the following @PREAMBLE command at the top of your bibliography database file:

```
@PREAMBLE{"\newcommand{\noopsort}[1]{}"}
```

Modify the year field or any other relevant field for proper sorting of the two bibliography items. For example:

```
For Vol. A entry : year = "{\noopsort{a}}1971"
For Vol. B entry : year = "{\noopsort{b}}1971"
```

If this does not work, put {\noopsort{a}} in front of the titles.
Question: How can I use URLs with BiBTEX?
Answer: From TEX–FAQ, there are two easy methods with \usepackage{url} or \usepackage{hyperref} package. The first one is to use howpublished field in the @misc function.

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[4]The tips in this section are collected from web sites or my personal experiences.

```
@MISC{...,
 ...,
 howpublished = "\url{http://...}",
}
```

The other one is to use `note` field with standard functions such as `techreport`, `article`, and `book`.

```
@TECHREPORT{...,
  ...,
  note = "\url{http://...}",
}
```

Question: How to put bibliography at each chapter in the book class?
Answer 1: If you use `thebibliography` environment, then put the following in the preamble.

```
\makeatletter
  \renewenvironment{thebibliography}[1]
  {\section*{\Large\bibname  % \chapter* is changed to \section*
  \@mkboth{\MakeUppercase\bibname}{\MakeUppercase\bibname}}%
  \list{\@biblabel{\@arabic\c@enumiv}}%
  {\settowidth\labelwidth{\@biblabel{#1}}%
  \leftmargin\labelwidth
  \advance\leftmargin\labelsep
  \@openbib@code
  \usecounter{enumiv}%
  \let\p@enumiv\@empty
  \renewcommand\theenumiv{\@arabic\c@enumiv}}%
  \sloppy
  \clubpenalty4000
  \@clubpenalty \clubpenalty
  \widowpenalty4000%
  \sfcode`\.\@m}
  {\def\@noitemerr
  {\@latex@warning{Empty `thebibliography' environment}}%
  \endlist}
\makeatother
```

Answer 2: If you use BibTeX, first load the `natbib` and `chapterbib` packages.

```
\usepackage[sectionbib]{natbib}
\usepackage{chapterbib}
...
\include{chap1}
\include{chap2}
...
```

Then each chapter file has the following form:

```
\chapter{title}
...
\bibliographystyle{apalike}
\bibliography{moga}
```

Question: I want no citation in the text but list in the bibliography.
Answer: With `\nocite{key}` the bib entry with the `key` is part of the bibliography without any citation in the body text.