

BIB^LA^TE^X- course notes

Science library. Informatics
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Coloured texts are links.

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Preface

This paper deals with the practical exercises in the BIB_AT_EX-course and saves you some note taking during the course. The exercises will help you build the bibliography given in the article entitled *User interface* from Encyclopedia of computer science[1].

What is a reference list? Why refer?

Without a reference list, a thesis is not finished. When working with research you always base your work more or less on previous works done by others. If you don't cite them when you do, it will be considered theft or plagiarism.

The reference list in your thesis should contain information on *every* document that you either cite, are referring to or from which you use ideas, definitions, illustrations, graphs, statistics or other results.

When giving definitions of concepts you should always cite the source, because this tells the reader what context you operate within.

The body text must contain *citations* which are pointers to the reference list. The reference list contains all the information that is necessary to locate and access the source.

Now, how far should you go in citing? This varies from discipline to discipline. If in doubt discuss this with your supervisor.

What might be considered as common knowledge, like the fact that the earth moves around the sun[2], need not be cited. What is common knowledge in one discipline, might not be in another. It also depends on for whom you are writing.

You should aim to cite the primary source. A secondary source might not have understood or cited the primary source correctly. Ensure yourself that you understand your source and that you express the source correctly.

The importance of consistent and correct references

The purpose of the reference list is to show the reader on which previous research your own work is based and to give the readers of your work a chance to evaluate it.

This means that references must contain the necessary and sufficient information elements to identify and locate the described document.

This course deals with the question of making a proper reference list using the tool BIB_AT_EX.

1 The bib-file and Emacs

1.1 Literature

The IFI departement has published a short guide to BIB_{La}TEX [3]. If you want to dive into it, you may read the BIB_{La}TEX package documentation[4].

A wiki-book on L_ATEX includes a useful page on BibTeX [5] with a short description of BIB_{La}TEX.

1.2 The bib-file

References are collected in a file with the extension *bib*. The connection between the L_ATEX file and the references in the bib-file is established by using identifiers (see below).

The bib-file may reside in the same file folder as the L_ATEX file or you may put it in the file folder `~/texmf/bibtex/bib` where BIB_{La}TEX always will find it.

1.3 Emacs

Create a folder called *biblatexcourse* in your home directory and locate yourself to this folder. Under Linux it looks like this:

```
> mkdir biblatexcourse
> cd biblatexcourse
```

Open a file named *myreferences.bib* in Emacs by giving the command¹:

```
> emacs myreferences.bib &
```

Emacs uses a certain BibTeX-mode when you open a bib-file. You will see a menu called *Entry-Types*. When you want to enter a new reference in your bib-file, you choose the reference type from this menu. The last option in this menu is BibTeX-dialect. The default selection of document types and fields are BibTeX, but may be changed to BIB_{La}TEX by using the last choice in the *Entry-types* menu (from version 24.2 of Emacs). Select BIB_{La}TEX.

After chosing a reference type you will see a list of empty fields, like this (*article in journal* or Ctrl-c Ctrl-e Ctrl-a):

```
@Article{,
  author =    {},
  title =    {},
  journaltitle = {},
  ALTyear =   {},
  ALTdate =   {},
  OPTvolume = {},
  OPTnumber = {},
  OPTpages =  {},
  OPTmonth =  {},
  ...
```

¹Under Windows, select *emacs.exe* from the program menu

}

Identifiers

Every reference in the bib-file must include a unique identifier. It must be entered directly following the first curly brace. A comma concludes the identifier.

As you are going to use this identifier when citing in your main L^AT_EX-document you should construct it easy to memorize, like: *shneiderman1983* and *olsen1992*.

Fields

The fields prefixed with *OPT* are optional, the others are mandatory. Sometimes two or more fields are prefixed with *ALT*. You must enter data into exactly one of them.

The text in the fields must be surrounded by quotes (" ") or curly braces ({}). There are two exceptions: you may enter clean numbers (a four digit year) and macros. See section 1.4.

The fields are separated by comma.

The author field

The name should be entered straight forward or with the last name first followed by a comma and then the rest of the name.

BIBL^AT_EX will try to split a straight forward name into four parts: first name, middle names like *von, van, de, . . .*, last name and finally additions like *junior, senior, . . .*. This procedure doesn't always succeed, so the safest way is to enter the last name followed by comma.

Several authors must be separated by the word **and**.

Initials in names should be entered with a period and a space, like this: Knuth, D. E..

These rules holds true also for other personal name fields: **editor, translator, . . .**

In general, you should try to enter the full names and no initials. The bibliographic style will decide whether the names will be presented with initials or not. If you do not know the full name, try normalising.

Uppercase letters

Information in some of the fields will be edited by BibTeX according to the style you have chosen. Uppercase letters might be converted to lowercase. This does not happen in BIBL^AT_EX. If you want to keep your own layout (e.g. acronyms like ACM and IEEE or person names in titles) put curly braces around your text.

1.4 Macros

Some information occurs often. It may be journal titles, publisher names, personal names and so on. To save typing and to ensure consistency you may use *macros* or *aliases*. The definition of the macro must appear in the beginning of the bib-file. Examples:

```
@string{ben    = "Shneiderman, Ben"}
@string{ojd    = "Dahl, Ole-Johan"}
@string{tochi  = "ACM Transactions on Computer-Human Interaction"}
@string{aw     = "Addison-Wesley"}
```

It is not possible to use two or more name macros in the author field. You will have to define a macro combining the names².

When the above macros are defined, you might enter (without curly braces or quotes):

```
author = ojd,
editor = ben,
journaltitle = tochi,
publisher = aw,
```

The macros will be expanded during the processing.

1.5 The most important reference types

We will only comment on the reference types most used. For each type we list mandatory fields and some recommended fields. In most cases the program **biber** will convert BibTeX data to BIBL^AT_EX³.

Article in journal

Mandatory: *author, title, journaltitle, year*
Recommended: *volume, number, pages.*

Book

Mandatory: *author, title, year/date*
When needed: *edition*

InBook

A part of a book which forms a self-contained unit with its own title.

Mandatory: *author, title, booktitle, year/date.*
Recommended: *publisher, pages.*

Collection

This type is not used in BibTeX.

²See an example in the tex-file later in this course.

³The databases from which we will fetch references still only support the BibTeX format.

Mandatory: *editor, title, year/date*
Recommended *publisher*

InCollection – Chapter in book

The type is meant for self-contained contributions in a collection. The contribution has its own author and title. The author refers to the title, the editor to the booktitle.

Mandatory: *author, editor, title, booktitle, year/date*.
Recommended: *publisher, year*.

Proceedings

Mandatory: *title, year/date*.
Recommended: *editor, publisher*.

InProceedings – conference paper

This is similar to `@incollection`.

Mandatory: *author, title, booktitle, year/date*.
Recommended: *editor, publisher, pages*.

Thesis/Mastersthesis/PhdThesis

For *thesis* BIB_AT_EX uses the field `type` to separate different thesis levels.

Mandatory: *author, title, type, institution, year/date*.

Report/TechReport

BIB_AT_EX uses `report` and adds a `type` field to separate between types of reports (default value is "technical report").

BIB_AT_EX: *author, title, type, institution, year/date*
Recommended: *number*(report number)

1.6 The crossref option

If you have several references from the same collection or conference it would be rather cumbersome to enter the shared information concerning the collection or the conference.

The solution is to enter a reference (book, collection or proceedings) that covers the whole document with the shared information, like the book title.

The references concerning the parts (chapter, paper) might then include the field `crossref` containing the identifier of the shared document.

Biber will then merge the information from the part and the whole (e.g. *inBook/Book*, *inProceedings/Proceedings* and *collection/inCollection*). See figure 1.

1.7 URLs

All reference types in BIB_AT_EX may include the field `url`. When using this one should also use the field `urldate` to show when this url was last accessed.

```

@InBook{dahlhoare,
  author = {Ole-Johan Dahl and C.A.R. Hoare},
  title = {Hierarchical program structures},
  chapter = {3},
  crossref = {strucprog},
  pages = {175-220}
}

@Book{strucprog,
  author = {Ole-Johan Dahl and C.A.R. Hoare
            and Edsger Dijkstra},
  title = {Structured programming},
  publisher = {Academic press},
  year = {1972}
}

\cite{dahlhoare}

[1] Ole-Johan Dahl and C.A.R. Hoare. "Hierarchical program structures".
    In: Ole-Johan Dahl, C.A.R. Hoare, and Edsger Dijkstra. Structured pro-
    gramming. Academic press, 1972. Chap. 3, pp. 175-220.

```

Figure 1: Using the reference types `InBook` and `Book` and the `crossref` field.

Date is important by several reasons. First of all: web pages have a tendency to change over time, you should document which version (date) you are referring to. Second: the documents often change their URLs. The url-date will be prefixed by the text **visited on** by default (contained in a variable called `urlseen`). You may change this text by the procedure described in section 3.12 on page 17.

It is also recommended that you keep a printed copy of the page for later control.

1.8 The date format

The date format depends on the document language and the format. You may define the format as options to the `BIBLATEX`-package. In this case you may differentiate between `date`, `urldate` and other dates. More on this issue in [4, pp. 50–53].

2 Exercise 1: Building the bib-file

We will now import some references from external sources and enter one by hand. The references are found on the accompanying sheet which is also the reference section of this document. The encyclopedia bibliography contains 11 references [6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16]. We shall take care of a few examples and then download a readymade bib-file.

Usually you will download the reference in parallel with downloading the

full document. *Make it a habit to fetch the reference data alongside fetching the document.* It will save you a lot of work later on.

- **Hutchins et al., 1986 [6]**

Google Scholar

Before searching, do this: select *Settings* from the horizontal menu. Scroll down to the section on *Bibliography manager*. Tick off *Show links to import citations into* and select BibTeX in the pull down menu. Save the preferences.

Search for **Hutchins Hollan Norman** in Google Scholar via [Library home page](#).⁴

Take a look at the first hit in the list. Click the link *Import into BibTeX*. You will then see the reference with BibTeX-syntax. Is this the reference we were looking for?⁵ Study other reference candidates down the page. Do you notice any peculiarities?⁶ The 26 versions do not contain a reference from 1986.

We will now try to find the reference in the *Collection of Computer Science Bibliographies (CCSB)*.^[17]

Click **Search** in the horizontal menu in the start page. Enter *Hutchins* in the search field and select *author* as qualifier and *1986* as publication year.

The third hit is the one we're looking for. To the right you will see two links: *BibTeX* and *5 duplicates*. Study the four duplicates and go back to take a look at the BibTeX-link. Copy the reference into your bib-file.

- **Olsen, 1992 [7]**

Go back to Google Scholar and try to find this reference by searching for *olsen user interface management*. Click *Import into BibTeX* link. Is it OK?⁷ Copy the reference to the bib-file.

- **Your own master thesis**

Select the correct reference type from the menu and enter data in the mandatory fields. Enter the command `Ctrl-c Ctrl-c` to clean up the record and generate an identifier.

- **Johnson et al., 1989 [8]**

This reference you will find in the *IEEE Xplore* service. Search for *johnson xerox star*.

⁴<https://www.ub.uio.no/informatics>

⁵No. Why not?

⁶A lot of citations of the relevant document are listed.

⁷Yes.

Tick the reference and pull down the *Download citations* menu. Select *BibTeX* and *Citation only*. Finally click *Download*. Copy the reference to the bib-file.

- **Hartson, 1989 [10]**

This reference we will find in *ACM Digital Library*.

A general description of the procedure: Click the title of the article in a hit list. The page which appear includes a grey text box to the right, marked *Tools and Resources*. At the bottom of this box there is a BibTeX-link. Using this link, you will get the BibTeX-reference in a separate window.

Move to the *ACM Digital Library* from the library home page. Click *Journals and Transactions* under the *Browse the digital library* header. You will get a list of all the journals of ACM (some called *transactions*).

Locate the journal *Computing Surveys*. Navigate to the journal page, then to the publication archive, to the correct issue and finally to the table of contents.

Study the BibTeX-reference. Note that ACM abbreviates the journal name. Copy the reference to your bib-file and correct the journal name.

The last references are handled by the same routines. As an exercise in the course aftermath, you may locate and copy the references from the sources⁸. We do not spend time on this. You may download a readymade bib-file from this location

<http://folk.uio.no/knuthe/biblatex/eng/>

Right-click on **references.bib** and save the file in the *biblatexcourse* directory.

Copy the reference of your thesis into this new bib-file.

3 Exercise 2: Using the bib-file with a document

A rough outline of a L^AT_EX document using BIBL^AT_EX is given in figure 2.

In this exercise you will use text located in the URL

<http://folk.uio.no/knuthe/biblatex/eng/>

Right-click on **userinterface.tex** and save the file in the *biblatexcourse* directory.

Open the file in Emacs. Your job is to replace every double-* reference with a proper citation command.

⁸You will find [9] in IEEE Xplore, [11, 12] in ACM Digital library and [13, 14, 15, 16] in Collection of Computer Science Bibliographies.

```

\documentclass[...]{...}
\usepackage[utf8]{inputenc}
\usepackage{...}
...
% biblatex-pakka med valg
\usepackage[backend=biber%
  style=numeric,%
  sorting=nyt,%
...]{biblatex}
\addbibresource{referanser.bib}
% diverse lokale tilpasninger av biblatex
\DefineBibliographyStrings{norsk}{%
  urlseen={Sett: }
}
...
% flere pakker og dine egne definisjoner

\begin{document}
...
  \cite{identifikator}
...
\printbibliography
\end{document}

```

Figure 2: Rough outline of a L^AT_EX-document using B_IB_LA_TE_X.

3.1 Character encoding

In figure 2 you see the line `\usepackage[utf8]{inputenc}`. This means that the character encoding of both tex and bib files. If you eventually use another character encoding in the bib file, you must state this by giving the option `bibencoding` for the `biblatex` package:

```
\usepackage[utf8]{inputenc}
\usepackage[bibencoding=latin1]{biblatex}
```

UTF8 is default at IFI.

3.2 A single or several bib-files

After loading the `BIBLATEX` package you must tell the system which bib-files you are using. You do this by giving this command in the preamble:

```
\addbibresource{bib-file name}
```

The bib extension is required. The command accepts only one file at a time and you will have to repeat it if you are using several bib-files. In that case you may want also to collect all your macros in one single file. This file must then be loaded first:

```
\addbibresource{macros.bib}
\addbibresource{library1.bib}
\addbibresource{library2.bib}
```

3.3 Citing

You must use a `cite` command including the reference identifier as a parameter value when you want to put a citation into your text:

```
\cite{identifier}
```

The identifier must be written exactly as it appears in the bib-file (case sensitive).

If you want to cite several references in the same cite command, it would look like this — no space after the comma:

```
\cite{identifier1,identifier2}
```

If you want a prefix or suffix in the citation the cite command accepts two other parameters:

```
\cite[prefix][suffix]{identifier}
```

If you want to refer to a certain page in the cited document, you would then write something like this:

```
\cite[See also][47]{identifier}
```

and this would be printed as [See also 19, p. 47]. For more `\cite`-commands, see [3, p. 14].

If you want a reference to appear in your reference list without explicitly citing it, you may write:

```
\nocite{identifier}
```

If you replace *identifier* with `*`, all of the references in your bib-file will appear in your reference list.

3.4 RefTeX – Locating and using a reference

Emacs RefTeX mode

An Emacs add-on (RefTeX) makes it easy to handle citations[18]. The package is recommended also by other reasons. It handles internal crossreferences in the \LaTeX file and makes it easy to use table of contents in Emacs.

Before setting Emacs in RefTeX mode, you must make a twist. RefTeX depends on knowing which bib-files you are using. RefTeX supports the BibTeX logic and will collect the bib-files from the `\bibliography`-command. To tell RefTeX to pick up the bib-file from the `\addbibresource` you must put the following in your .emacs file:

```
(setq refTeX-bibliography-commands
      '("addbibresource" "bibliography" "nobibliography"))
```

The snag here is that RefTeX only picks the first bib-file given by `\addbibresource`. If you use several bib-files, you must give them in a single `\bibliography` command⁹:

```
\bibliography{macros,references}
```

You put Emacs in RefTeX mode by giving the command `M-x refTeX-mode`.¹⁰ Please note the new top menu (Ref).

You may set Emacs in RefTeX mode initially by adding these commands to the .emacs file:

```
(autoload 'refTeX-mode "refTeX" "RefTeX Minor Mode" t)
(autoload 'turn-on-refTeX "refTeX" "RefTeX Minor Mode" nil)
(add-hook 'LaTeX-mode-hook 'turn-on-refTeX)
```

⁹The command must be given in the preamble. No bib extension is needed.

¹⁰M-x means first pressing the ESC-button and then the x

Searching the bib-files

The RefTeX mode will make it possible to locate references by searching the bib-file with regular expressions.

Place the cursor where you want the cite-command to appear. Select `\cite` from the Ref menu (or use the command `C-c []`). Enter the regular expression plus Return. Eventually you will get a hit list. You may navigate in the hit list by using the up/down arrows and selecting a reference by hitting Return. A cite command will appear with the correct identifier.

If you require two or more citations in your cite-command, just place the cursor before the last curly brace and repeat the RefTeX cite-command.

Now, replace the double-* citations with proper cite-commands in the rest of the text.

3.5 Bibliographic styles

Styles for citations and references are loaded as an option to the `BIBLATEX` package:

```
\usepackage[... ,
  style=styleoption,
  ...]{biblatex}
```

The `style` gives the styles for both citations and references at the same time. But they might be differentiated:

```
citestyle=styleoption-1,
bibstyle=styleoption-2,
```

Here is a list of the most common styles¹¹:

numeric – the citation is given as a number in brackets ([23]). This number points to a numbered list of references. The sorting of the references might be decided as an option in the preamble. In *this* document **none** is chosen as the sort option, which means that references appears in the order they are cited.

alphabetic – the citation is a combination of parts of the author name and the publication year ([KNU99]). The references are sorted according to this combination.

authortitle – the citation is the last name of the author followed by the title of the work in italics. To get parentheses around the citation you must use the `\parencite` instead of `\cite`.¹² The references are sorted by name and title.

¹¹To see more styles check out `BIBLATEX` package manual [4, pp. 65–70].

¹²Or you may type the parenthesis yourself around the `cite` command.

authoryear – the citation is a the last name of the author followed by the year of publication. You must use the `\parencite` to get parentheses around the citation. The references are sorted by name and year.

If you want to use one of the styles APA (American Psychological Association) or Chicago, check out the local guide.[\[3\]](#)

3.6 Generating the reference list

Put this command in the L^AT_EX-file where you want the reference list to appear:

```
\printbibliography
```

You then run the following commands in your terminal window:

```
> pdflatex userinterface.tex
> biber userinterface
> pdflatex userinterface.tex
> pdflatex userinterface.tex
```

This is what happens: The first `pdflatex` command produces some intermediate files that the **biber** program uses to pick the cited references from the bib-files and formatting them according to the styles. The result will be included in the next `pdflatex` processing.

If the processing is without error messages, you might inspect the result in the `userinterface.pdf` file.

In Linux command mode at IFI you may give the command

```
> ltx userinterface.tex
```

which takes care of all the steps above.

3.7 Using other styles

Try to change the style to *alphabetic* and process the tex file. Check the result, both citations and references.

Try changing the style to *authoryear* and process the file. Please note that you no longer get brackets around your citation. Change one or more `\cite` commands to `\parencite` and re-process. Check also the sorting order of the reference list.

Finally, change back to the *numeric* style. You need not change the `\parencite` command.

3.8 The reference list header

The header of the reference list is taken from the value of a \LaTeX -variable which in turn is loaded to the $\text{BIB}\text{\LaTeX}$ -variable `bibliography`.

The name of the variable is `\refname` when using the document class *article*, and `\bibname` for the *book* document class. The default values of these variables are *References* and *Bibliography* respectively.

You may give these variables new values by using the `renewcommand` like this:

```
\renewcommand{\refname}{Literature}
```

You may also state the header explicitly in the `printbibliography` command:

```
\printbibliography[title={Literature}]
```

A third possibility is mentioned on page 16.

3.9 Including the reference list in the contents

The reference list will not automatically be included in the table of contents. To add an entry you give the command `addcontentsline` directly after the `printbibliography` command in the \LaTeX file. To ensure consistency, define the `\refname` (or `\bibname`) variable first:

```
\renewcommand{\refname}{Literature}
\printbibliography
\addcontentsline{toc}{section}{\refname}
```

The *toc* tells the system to put a line in the table-of-contents. The *section* states which document level to be used and lastly what to put there: the value of the variable `\refname`.

3.10 Referring backwards

When your document grows, it will be difficult to remember just where you cited a certain reference.

You may use the package *hyperref* [19] which generates backward citations. That is, for every reference in the reference list page numbers are added to show where the reference is cited. To achieve this, you add the following command in the \LaTeX preamble:

```
\usepackage{hyperref}
```

after loading the $\text{BIB}\text{\LaTeX}$ -package. You must also give the option `backref` to $\text{BIB}\text{\LaTeX}$. The *hyperref* package also generates internal and external links in the document.

Take a look at the reference list in this document to see how it works.

3.11 Section-, type- or chapterwise reference lists

Reference list in each section

You may generate reference lists for each chapter or section by marking the start and end of a *refsection* and print the bibliography within such a section:

```
\chapter{...}
  \begin{refsection}
  ...
  \printbibliography
  \end{refsection}

\chapter{...}
  \begin{refsection}
  ...
  \printbibliography
  \end{refsection}
```

All citations given within the reference section will be included in the reference list of that chapter or section.

Any citations appearing outside a reference section will be included in an overall bibliography.

Sectionwise reference lists at the end

If you want a chapter- or sectionwise bibliography in the end of the document, you still define reference sections as above, but you do not usually print them in each section. This is what you might do in the end of your document:

```
\printbibheading
\printbibliography[section=1, heading=subbibliography]
\printbibliography[section=2, heading=subbibliography]
\printbibliography[section=3, heading=subbibliography]
...
```

The first command prints the general bibliography header, e.g. **References**.

The commands following will print the references for the relevant section with the header defined by the variable *subbibliography*. This header might be defined in the preamble as follows:

```
\defbibheading{subbibliography}{%
  \section*{References for Chapter %
  \ref{refsection:\therefsection}}}
```

Try this with your userinterface file!

Document type or topics reference lists

You may produce separate lists depending on document type as used in the bib-file: books, articles etc. Enter the command `\nocite{*}` and try this in the `userinterface.tex` file (the commands are already added as comments at the end of the file):

```
\printbibheading
\printbibliography[type=book, title={Books}]
\printbibliography[type=article, title={Articles}]
\printbibliography[type=manual, title={Manuals}]
\printbibliography[notype=book, notype=article, %
notype=manual, title={Other documents}]
```

To ensure a running sequence of reference numbers you must use the option `defernumbers=true` to the `biblatex-package`.

You may also make a bibliography with the references separated according to different topics entered in the `keywords` field:

```
\printbibheading
\printbibliography[keyword=comm, title={Communication}]
\printbibliography[keyword=soft, title={Software}]
```

3.12 Changing the value of bibliography strings

There is a lot of text strings you may redefine. Most of them will contain reasonable default values, so be careful. Here is an example showing how you can redefine some strings¹³:

```
\DefineBibliographyStrings{english}{%
  urlseen={Seen:},
  bibliography = {Literature},
  references = {Literature},
  page={page},
  pages={pages},
  and={\&},
}
```

As you see from the command, such text strings must be associated with the document language, in this case *english*.

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/undervisning/biblatex-kurs/biblatexbooklet.tex

¹³You will find a list of such strings in section 4.9 in the `BIBLATEX-manual`[4, see section 4.9, p.215]

(notes)

Literature

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- [2] Nicolaus Copernicus. *De Revolutionibus Orbium Coelestium*. apud. Ioh. Petreium, 1543. <http://ads.harvard.edu/books/1543droc.book> (Seen: 01/31/2017) (cit. on p. 2).
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A few general Emacs-commands

Ctrl-X Ctrl-f	Open
Ctrl-x Ctrl-s	Save
Ctrl-y	Paste
Ctrl- <u> </u>	Undo (Ctrl-underscore)
Ctrl-s	Search buffer
Ctrl-c [Search bib-file (reftex-cite)

Emacs bib-file commands

TAB	puts the cursor at the end of the current field
Ctrl-J	puts the cursor at the beginning of the next field
Ctrl-C Ctrl-C	concludes the entering of a reference. You will be warned about empty mandatory fields. Emacs will propose an identifier if you have not entered one yourself. Empty optional fields will be removed.
Syntax check	If you select the menu BibTeX-Edit > Operating on Buffer or Region > Validate Entries a syntax check is performed on the bib-file.
Format entries	If you select the menu BibTeX-Edit > Operating on Buffer or Region > Format Entries the references will be formatted.