

Module 3

Cross-referencing – numbering, bibliographies

\LaTeX numbers various parts of a document for you. We have already seen many examples in the first two modules: page numbers, chapter and section headings, enumerated lists, captions for tables and figures, equation numbers. . . there are many more. \LaTeX also automatically adjusts when content is added or removed, but how can we actually refer to the numbering in a document without having to know explicitly what the numbers are?

In this module we'll look at cross-referencing, and the closely related topic of citations from a bibliography. We'll also see how to create a table of contents, list of figures and list of tables.

There are exercises throughout, and I encourage you to try them first before looking at the solutions. Note:

- \LaTeX keeps track of numbering via the auxiliary files, so you may need to run it twice to get the output you expect — see Figure 1.2 of Module 1.
- The way \LaTeX displays some numbers depends on the document class. These exercises were designed for the `book` class with no optional arguments, so that's what you should use today. However, when you get a chance you should also have a look at what happens in the `article` and `report` classes (recall though that there are no `\chapter`'s in an `article`).
- The numbers in your output will depend on what else is in your \LaTeX source file. You should be able to obtain the exact numbering that appears in the exercises by typesetting each of them at the top of your document, or in a separate document.
- Some of the exercises are displayed here in a condensed format, for example if you are asked to typeset an entire page. Therefore the spacing you achieve may be quite different, but it's how you obtain the content which is important.

Footnotes and marginal notes

We'll begin by looking at one more command which produces numbered output.

Footnotes are produced with the `\footnote` command. This command takes one mandatory argument, the text which is to appear in the footnote, and it is placed in the source code precisely where the footnote marker is required:

```
The \verb+\footnote+ command
produces footnotes\footnote{Here
is an example of an intuitive
command name in \LaTeX.} and
automatically numbers them for
you.
```

The `\footnote` command produces footnotes¹ and automatically numbers them for you.

¹Here is an example of an intuitive command name in \LaTeX .

By default the footnotes are numbered 1, 2, 3, ... (although we will see how to change this later). There is another special type of footnote which is used in the title of a document. The `\thanks` command can appear in the argument of `\title`, `\author` or `\date` (the three commands associated with `\maketitle`). The syntax is precisely the same as for `\footnote`, but in the `article` document class the footnotes are marked successively by the following nine symbols:

* † ‡ § ¶ || ** †† ‡‡

```
\title{An example
article\thanks{A good one
too!}}
\author{Pierre de
Fermat\thanks{1601--1665.}
and Chris Wetherell}
\date{December 25, 1960}
\maketitle
```

An example article*

Pierre de Fermat[†] Chris Wetherell

December 25, 1960

In this article we answer...

```
In this article we
answer...
```

*A good one too!
[†]1601–1665.

Here is where marginal notes go on even pages.

A closely related command is `\marginpar`. This creates an *unnumbered* marginal note, which is placed in the margin adjacent to the line in which the command appears

(or as near as possible). The source code used to produce this paragraph, including the marginal note on the left of the previous page, is as follows:

```
...marginal note,\marginpar{\raggedright Here is where marginal
notes go on even pages.} which is placed in the margin adjacent to
the line in which...
```

Here's the position of notes on odd-numbered pages.

Notice the use of `\raggedright` to left-justify the text of that note. The default is to left-right justify, if possible, which can be unsightly — see the note to the right.

Exercise 3.1. Typeset the following page using the `\footnote` and `\marginpar` commands:

\LaTeX has some nice commands for producing footnotes¹ and marginal notes. Maybe I'll stick to writing everything in the main body of my document.²

Note to self: don't use marginal notes.

¹Like this one.

²Good thinking.

Cross-referencing

If at all possible you should avoid referring to the numbering in your document explicitly. For example we know this is page 3·3, but I would never type `page~3\cdot3` for two reasons: I might insert or delete some text before this point which could change the number of this page; I might decide at a later point (and believe me, I have) that 3·3 is a ridiculous way to number the pages and I should use something else (sadly, Module 1 set the precedent so I'll stick with it for now!)

Of course if you only refer to a handful of the numbers in your document then you might get away with doing it by hand... but you'll probably want to cross-reference dozens, perhaps hundreds, of times. This doesn't just get annoying — you're likely to make mistakes. So... let \LaTeX keep track of everything for you, with a little help.

The key to cross-referencing is just that: **keys**. A key is any string (consisting of letters, numbers and punctuation characters) which you choose and associate with something in the document that you wish to refer to. Usually this something will be numbered, like an equation or section heading, but it doesn't have to be. Keys never appear in the output, so they can be anything you like; I recommend you give them a functional name, though, so you can remember what they refer to.

The `\label`, `\ref` and `\pageref` commands all take the name of a key as a mandatory argument, and they function as follows:

- `\label` is used to define a key, and the location of this command determines what it is that is being labelled;
- `\ref` prints, in the output, the number associated with a key, if there is one;
- `\pageref` prints the number of the page in which the key was defined.

More often than not the required location of a `\label` is obvious: if you want to refer to a numbered equation, put the `\label` command inside the `equation` environment; if you want to refer to a numbered chapter, put the `\label` *after* the `\chapter` command. Sometimes you may need to tinker with the positioning of a `\label` to make sure it works correctly: to label a `table` or `figure`, you need to put the `\label` after the `\caption` command inside that environment.

```
\begin{table}
  \centering
  \begin{tabular}{|c|}
    \hline A \\\ \hline
  \end{tabular}
  \caption{A boring table}
  \label{boring}
\end{table}
```

A

Table 3.1: A boring table

```
Table~\ref{boring} really is
boring, even if it does appear
on page~\pageref{boring}.
```

Table 3.1 really is boring, even if it does appear on page 3·4.

Note that only the numbers 3.1 and 3·4 were produced by `\ref` and `\pageref` respectively. You need to enter `Table` and `page` into the source code yourself (of course there are good reasons for this: pages 4–7, Equations (3.1) and (4.2) etc.). Also note that a `\ref` command can refer to a key *before* it is defined by `\label`, as in Exercise 3.3 below.

Exercise 3.2. Use `\label`, `\ref`, `\pageref` and the `equation` environment to typeset the following:

The following equation, namely

$$a^2 + b^2 = c^2, \tag{1}$$

is labelled (1) and appears on page 1.

Exercise 3.3. Use `\label`, `\ref` and `\footnote` to typeset the following page:

Is this a footnote¹ I see before me?²

¹See footnote 2 below.

²Yes, it is.

Exercise 3.4. Use `\label`, `\ref`, `\chapter`, `\section` and `\subsection` to typeset the following:

Chapter 1

A chapter

1.1 A section

Moving right along...

1.1.1 A subsection

This subsection is part of Section 1.1, which is contained in Chapter 1.

Remember that L^AT_EX keeps track of numbering and cross-referencing via the auxiliary files which were created on the *previous* run. Therefore you should expect to regularly get warnings such as

```
LaTeX Warning: Reference 'pythagoras' on page 3 undefined on
input line 121.
```

and

```
LaTeX Warning: Label(s) may have changed. Rerun to get
cross-references right.
```

Simply re-run L^AT_EX as advised. If such warnings persist after immediately re-running then you've probably done something wrong, like misspelled the name of a key.

L^AT_EX will also complain if you have tried to define the same key twice with a `\label`:

```
LaTeX Warning: Label 'pythagoras' multiply defined.
```

In this situation it's a very good idea to change one of the keys.

Bibliographies

Citations from a bibliography are handled, in much the same way as cross-referencing, via **keys**.

There are two ways to create a bibliography: with the `thebibliography` environment which you are largely responsible for typesetting yourself, or with BIB_TE_X which makes

a lot of typesetting decisions for you. There are many additional reasons why using `BIBTEX` is preferable, but that will be for another course.

The `thebibliography` environment is very similar to the list environment `enumerate`, but there are a few important differences:

- In the `book` and `report` document classes this environment starts a new page titled “Bibliography”. In the `article` class there is no new page, and the title is “References”.
- Labels for each item appear in square brackets. The default labels are [1], [2], ...
- The `thebibliography` environment takes one mandatory argument which is a piece of text of the same width as the largest label required. If you are using the default labels and have between 10 and 99 items in the bibliography you might use `\begin{thebibliography}{88} ... \end{thebibliography}`
- Items in the bibliography are defined with the `\bibitem` command (instead of `\item`). It takes one mandatory argument which is the key for that item (compare with `\label`) and one optional argument which overrides the default label.

An example follows.

Bibliography

```

\begin{thebibliography}{St.M}

\bibitem{fermat} P. de Fermat,
  ‘On certain diophantine equations’.
\emph{J. Marginal Notes}
\textbf{13}:221--237, 1640.

\bibitem[St.M]{stmark} St. Mark,
  ‘The Gospel According to Me’.
  In: \emph{New Test.}, John, Luke
  et al, editors, c. 39 CE.

\bibitem{mynotes} C. Wetherell,
  ‘\LaTeX notes’. ANU Library, 2003.

\end{thebibliography}

```

[1] P. de Fermat, ‘On certain diophantine equations’. *J. Marginal Notes* **13**:221–237, 1640.

[St.M] St. Mark, ‘The Gospel According to Me’. In: *New Test.*, John, Luke et al, editors, c. 39 CE.

[2] C. Wetherell, ‘ \LaTeX notes’. ANU Library, 2003.

Note that you are responsible for the look of entries in the bibliography, and the order in which they appear.

Citations are now easily produced with the `\cite` command, which is very similar to the cross-referencing command `\ref`. It takes a key, or list of keys, as its mandatory argument. It also takes one optional argument which allows you to make a more specific citation, for example with a chapter or page reference:

```

\label{thispage}
Clearly \cite{fermat, stmark}
have been cited in
\cite[p~\ref{thispage}]{mynotes}.

```

Clearly [1, St.M] have been cited in [2, p 3·7].

Again L^AT_EX relies on the auxiliary files to deal with citations, so if it gives warnings similar to those for cross-referencing on page 3·5, simply run L^AT_EX again (and then check for misspelled, undefined or multiply defined keys if necessary).

Exercise 3.5. Typeset the following pages using the `thebibliography` environment and the `\bibitem`, `\cite` and `\chapter` commands:

Chapter 1

Bibliography

Fun citations

In [MP3] it is noted that Fermat [2, 3] was not as thorough as [4]. That's a shame (especially given the treatment in [1, IX,4.2]).

- [1] D. Adams, 'Answers to almost everything from beyond the grave'. Penguin, New York, 2003.
 - [2] P. de Fermat, 'Addendum: On a little theorem'. In: *Proc. Nice Symp. (France, 1639)*. Acad. Press, London, 2001.
 - [3] P. de Fermat, 'Corregendum: Addendum: On a little theorem'. Manuscript, 1640.
 - [4] A. K. A. Prince, 'Raspberry Beret'. *J. Pop. Mus.*, **1**:1–7, 1983.
- [MP3] M. P. Three, 'Law: a case study', in preparation.

This all works very nicely... so why use BIB_TE_X? With this method the bibliographic information is contained in a separate file, `mybib.bib` say, and only those items which are explicitly `\cite`'d in your document will appear in its bibliography (or you can specify an uncited item to be included with the `\nocite` command). Also, the entries in `myfile.bib` are encoded with little or no specific formatting – the way the entries are

typeset in a document's bibliography can be chosen from one of a handful of standard styles, or completely customised if necessary. **Therefore you need only create one bibliography file *ever!*** You can use it over and over again for as many documents as you like, adding new entries when necessary without ever affecting old documents.

For more details enrol in the ILP's BIBTEX course, or see the notes at

<http://wwwmaths.anu.edu.au/~chrisw/LaTeX>

List of figures, list of tables, and table of contents

Creating a list of figures or a list of tables is as simple as typing

```
\listoffigures    or    \listoftables
```

at the point in the source code where you want them to appear (usually near the beginning of your document). These lists display the caption and page number of, respectively, every `figure` and `table` environment which contains a `\caption` command. Uncaptioned figures and tables are not automatically listed.

Creating a table of contents is also simply a matter of typing

```
\tableofcontents
```

at the relevant position in the source code. The table of contents automatically lists the heading and page number of the *numbered* sectional units, such as `\chapter` and `\section`. It will *not* automatically include starred variations, such as `\chapter*` and `\section*`. Nor will it automatically include the Bibliography.

The `\addcontentsline` command can be used to manually add entries to the list of figures (lof), list of tables (lot) or table of contents (toc). It takes three arguments: the first is one of `lof`, `lot` or `toc` which specifies where the entry is to be added; the second argument specifies the kind of entry it is (`figure` for `lof`, `table` for `lot`, and one of `chapter`, `section` etc. for `toc`); the third argument is the text of the entry.

The `addcontentsline` command should appear inside the environment or immediately after the sectioning command you wish to include. Thus to have the Bibliography appear in the table of contents of a `book` your document body might look like:

```
\tableofcontents
:
:
\begin{thebibliography}{88}
  \addcontentsline{toc}{chapter}{Bibliography}
  :
\end{thebibliography}
```

In an `article` replace `chapter` with `section`, and `Bibliography` with `References`.

Exercise 3.6. Use the `table` environment and the `\chapter`, `\centering`, `\caption`, `\label`, `\ref`, `\listoftables` and `\addcontentsline` commands to typeset the following pages (there is no need to use the `tabular` environment):

List of Tables

Table preceding Table 1.1.....	3
1.1 A captioned table	3

Chapter 1

Tables

A table without caption:

A

A table with caption:

B

Table 1.1: A captioned table

Counters and renumbering

Counters are what L^AT_EX uses to display and cross-reference numbering in a document. Every command or environment which automatically generates a number has a counter associated with it, and there are some counters like `page` which exist independently. See Table 3.1 for some of the common ones.

The counters in Table 3.1 which are associated with a command or environment are incremented with each instance of that command or environment. In particular the `\enumi...` counters are incremented with each `\item` in the relevant nested `enumerate` environment. The `page` counter is obviously incremented with each new page of output.

Note that the `page` counter starts with a value of 1 and is incremented at the *end* of each page. All other incremented counters begin with a value of 0 and are incremented *before* they are used. The `secnumdepth` and `tocdepth` counters are not incremented at all.

Some counters are reset to 0 when another counter is incremented. For example, starting a new `\chapter` increments the `chapter` counter by 1 and resets `section`, `subsection` etc. to 0; depending on the document class and how things are numbered, it may also reset `equation`, `footnote`, `table` and `figure`. Note however that a new `\part` does *not* reset the `chapter` counter.

Even though L^AT_EX takes care of incrementing and resetting for you, occasionally you might need to manually set the value of a counter. This is done with either the `\setcounter` command or the `\addtocounter` command. Both take two mandatory

Command, environment or description	Counter name
<code>\part</code>	<code>part</code>
<code>\chapter</code>	<code>chapter</code>
<code>\section</code>	<code>section</code>
<code>\subsection</code>	<code>subsection</code>
<code>\footnote</code>	<code>footnote</code>
<code>equation</code>	<code>equation</code>
<code>eqnarray</code>	<code>equation</code>
<code>table</code>	<code>table</code>
<code>figure</code>	<code>figure</code>
<code>\item</code> in <code>enumerate</code>	
<i>1st level nesting</i>	<code>enumi</code>
<i>2nd level nesting</i>	<code>enumii</code>
<i>3rd level nesting</i>	<code>enumiii</code>
<i>4th level nesting</i>	<code>enumiv</code>
<i>page numbers</i>	<code>page</code>
<i>numbering depth for sectioning commands</i>	<code>secnumdepth</code>
<i>table of contents depth</i>	<code>tocdepth</code>

Table 3.1: Counters in L^AT_EX

arguments: the first argument is the name of the counter to be altered; the second is, respectively, the new value of this counter or the amount by which it should be incremented (which may be negative). Thus to start a new document at page 5 you might use

```
\setcounter{page}{5}
```

or

```
\addtocounter{page}{4}
```

To make sure the next chapter is number 4, use

```
\setcounter{chapter}{3}
\chapter{A renumbered chapter}
```

Recall that the `\chapter` command will increment the `chapter` counter to 4 as desired. If you want a pair of footnotes in reverse order like this⁴ and this³ you would type:

⁴Why?

³Why not!

...like this `\addtocounter{footnote}{1}\footnote{Why?}` and `this\addtocounter{footnote}{-2}\footnote{Why not!}\addtocounter{footnote}{1}` you would type:

The last `\addtocounter` ensures that the next footnote will be number 5.

Some displayed numbers in the output are produced from the values of two or more counters. For example, a `\section` command in the `book` or `report` document class creates a number like 5.2; here the 5 is the value of the `chapter` counter and the 2 is the value of the `section` counter. To make sure the next section is numbered 4.4, for example, you need:

```
\setcounter{chapter}{4}
\setcounter{section}{3}
\section{A renumbered section}
```

(The `\section` command only increments the `section` counter.)

Note that the way a number is printed by a `\ref` command is *not* affected by subsequent changes to the counters involved, as you will see in the next exercise.

Exercise 3.7. Typeset the following using the `equation` environment and the `\chapter`, `\section`, `\subsection`, `\label`, `\ref` and `\setcounter` commands:

Chapter 3

Renumbering: oh, peril!

This is Chapter 3. Okay, no problem.

4.5 A badly numbered section

It gets worse:

$$a^2 = b^2 + c^2 \tag{5.7}$$

0.2.0 The final straw

As if Equation (5.7) in Section 4.5 wasn't bad enough...

You may have noticed already that in the `book` document class chapters, sections and subsections are numbered like 1, 1.1 and 1.1.1 respectively, but that subsubsections are not numbered at all. Also, the `\tableofcontents` lists chapters, sections and subsections, but not subsubsections. These properties of a document can be customised

with the `secnumdepth` and `tocdepth` counters. Each counter is set to an integer value which represents the desired level of sectional unit, as listed in Table 3.2.

	book/report	article
part	-1	0
chapter	0	-
section	1	1
subsection	2	2
subsubsection	3	3
paragraph	4	4
subparagraph	5	5

Table 3.2: Sectional unit levels

Thus the default values in the `book` class are 2 (subsections) for `secnumdepth` and 2 (subsections) for `tocdepth`. It is now simply a matter of specifying the value of these counters with `\setcounter`, or `\addtocounter`, to achieve the numbering depth or table of contents depth you desire. (You would normally do this in the preamble.)

Exercise 3.8. Use `\tableofcontents`, sectioning commands, and `\setcounter` with `tocdepth` and `secnumdepth` to typeset the following pages:

Contents

1	Zeroth level	3
	1.1 First level numbering	3

Chapter 1

Zeroth level

1.1 First level numbering

1.1.1 Second, still usually numbered

1.1.1.1 But the third isn't by default

Customising displayed numbers

Each counter takes an integer value, but we have noted already that `\section` numbers might be printed like 5.2, produced from the `chapter` and `section` values separated by a period. The way a number is printed in the output is controlled by a `\the...` command, and these can be redefined to customise the numbering in your document.

The command associated with a counter called *ctr* is `\thectr`. For example, `page` and `chapter` numbers are produced with `\thepage` and `\thechapter` respectively. L^AT_EX uses these commands behind the scenes, so while you may redefine what they produce you would rarely use them yourself in the document body.

(You *could* typeset “This is page 3-13 of Module 3” with

```
This is page~\thepage\ of Module~\thechapter
```

but these commands only ever produce the *current* page, chapter etc. so you would be better off using `\label` and `\ref` in general.)

In addition to `\thectr` commands, there are six formatting commands which tell L^AT_EX how to convert the integer value of a counter into the symbol which is printed. So far we have dealt mainly with numerical symbols, where a counter with value 5 produces the printed number 5. However it is also possible to convert to roman numerals, letters, and the sequence of symbols used for the `\thanks` footnoting command. Table 3.3 lists these formatting commands; each takes the name of a counter as its one mandatory argument.

<code>\arabic</code>	1, 2, 3, 4, ...
<code>\roman</code>	i, ii, iii, iv, ...
<code>\Roman</code>	I, II, III, IV, ...
<code>\alph</code>	a, b, c, ..., z
<code>\Alph</code>	A, B, C, ..., Z
<code>\fnsymbol</code>	*, †, ‡, §, ¶, , **, ††, ‡‡

Table 3.3: Counter formatting commands

L^AT_EX will produce an error if `\alph` or `\Alph` is applied to a counter with value greater than 26, or if `\fnsymbol` is applied to one greater than 9. Also note that `\fnsymbol` can only be used in maths-mode, so it will usually need to be enclosed in a pair of `$`'s.

Sections are labelled like 5.2 in the `book` document class because `\thesection` is defined to be

```
\arabic{chapter}.\arabic{section}
```

by default. My crazy page numbers are produced by redefining `\thepage` to be

```
\arabic{chapter}$\cdot$\arabic{page}
```

To redefine a `\thectr` command use `\renewcommand`. This takes two mandatory arguments: the name of the command and its new definition. The new definition can include any text or symbols you like, and usually at least one of the formatting commands in Table 3.3. Thus my page numbers were defined with

```
\renewcommand{\thepage}{\arabic{chapter}$\cdot$\arabic{page}}
```

in the preamble.

If a `\thectr` is redefined somewhere in the document body, then the changes only take effect from that point on. A reference to an earlier number via `\ref` will still produce the correct output, however.

Page number style can also be defined by the shortcut `\pagenumbering{format}`. This is equivalent to

```
\renewcommand{\thepage}{\format{page}}
```

where `\format` is one of the six formatting commands of Table 3.3. For example, `\pagenumbering{roman}` produces pages numbered i, ii, iii, etc.

Exercise 3.9. Typeset the following using an `eqnarray` environment and `\renewcommand` to redefine chapter, section and equation numbering:

Chapter A

Upper case

a Lower case

$$a = b + c \tag{A.a.1}$$

$$= d \tag{A.a.2}$$

Exercise 3.10. Use `\renewcommand` and `\setcounter` to typeset the following:

Chapter 1

Silly footnotes

These footnotes^{1-†} are very^{1-‡} silly^{1-§}.

^{1-†}Yes, these ones.

^{1-‡}And I mean *very*.

^{1-§}Indeed.

Exercise 3.11. Redefine section numbering twice, and use `\label` and `\ref` to typeset the following:

Chapter 1

More sections

1.1 The first section

I-B The second section

i/c The third section

Chapter 1 and Sections 1.1, I-B and i/c are still cross-referenced correctly.

Note that in an `enumerate` environment the labels created with `\theenum...` commands behave a little differently. In the first and third levels of nesting the label is automatically followed by a period; in the second and fourth levels the labels are automatically enclosed in parentheses — see the next exercise.

Exercise 3.12. Typeset the following `enumerate` list by redefining `\enum...` commands:

- A. The first item, with
 - (A-1) a few subpoints, like:
 - 1.i. this one,
 - 1.ii. and this one;
 - (A-2) another subpoint.
- B. The second item.

Solutions to exercises

These are just some of the possible solutions — you may have come up with something slightly different which is just as valid. Remember that all multiple spaces are ignored, but it is sometimes helpful to set out your source code in a logical way.

- (3.1) `\LaTeX` has some nice commands for producing footnotes`\footnote{Like this one.}` and marginal notes.`\marginpar{\raggedleft Note to self: don't use marginal notes.}` Maybe I'll stick to writing everything in the main body of my document.`\footnote{Good thinking.}`
- (3.2) The following equation, namely`\begin{equation}\label{pythagoras}a^2+b^2=c^2,``\end{equation}` is labelled (`\ref{pythagoras}`) and appears on page`\pageref{pythagoras}`.
- (3.3) Is this a footnote`\footnote{See footnote~\ref{yes} below.}` I see before me?`\footnote{Yes, it is.\label{yes}}.`
- (3.4) `\chapter{A chapter}\label{thischapter}`

`\section{A section}\label{thissection}`
Moving right along`\ldots`

`\subsection{A subsection}`
This subsection is part of Section`\ref{thissection}`, which is contained in Chapter`\ref{thischapter}`.
- (3.5) `\chapter{Fun citations}`

In `\cite{mp3}` it is noted that Fermat`\cite{fadd,fcor}` was not as thorough as `\cite{prince}`. That's a shame (especially given the treatment in `\cite{IX,4.2}{adams}`).
- ```
\begin{thebibliography}{MP3}
\bibitem{fadd} P. de Fermat, 'Addendum: On a little theorem'. In:
\emph{Proc. Nice Symp. (France, 1639)}. Acad. Press, London, 2001.
\bibitem{fcor} P. de Fermat, 'Corregendum: Addendum: On a little
theorem'. Manuscript, 1640.
\bibitem{prince} A. K. A. Prince, 'Raspberry Beret'. \emph{J. Pop.
Mus.}, \textbf{1}:1--7, 1983.
\bibitem[MP3]{mp3} M. P. Three, 'Law: a case study', in preparation.
\bibitem{adams} D. Adams, 'Answers to almost everything from beyond
the grave'. Penguin, New York, 2003.
\end{thebibliography}
```



- (3.6) `\listoftables`
- ```

\chapter{Tables}
A table without caption:
\begin{table}[ht!]
\centering
A
\addcontentsline{lot}{table}{Table preceding Table~\ref{captioned}}
\end{table}

A table with caption:
\begin{table}[ht!]
\centering
B
\caption{A captioned table}
\label{captioned}
\end{table}

```
- (3.7) `\setcounter{chapter}{2}`
`\chapter{Renumbering: oh, peril!} \label{chaprenum}`
- This is Chapter~\ref{chaprenum}. Okay, no problem.
- ```

\setcounter{chapter}{4}\setcounter{section}{4}
\section{A badly numbered section}\label{secrenum}

\setcounter{chapter}{2}\setcounter{equation}{6}
It gets worse:
\begin{equation}\label{badeqn}
a^2=b^2+c^2
\end{equation}

\setcounter{section}{2}\setcounter{chapter}{0}
\setcounter{subsection}{-1}
\subsection{The final straw}
As if Equation~(\ref{badeqn}) in Section~\ref{secrenum} wasn't bad
enough\ldots

```
- (3.8) `\setcounter{tocdepth}{1}`  
`\tableofcontents`  
`\setcounter{secnumdepth}{3}`
- ```

\chapter{Zeroth level}
\section{First level numbering}
\subsection{Second, still usually numbered}
\subsubsection{But the third isn't numbered by default}

```

- (3.9) `\renewcommand{\thechapter}{\Alph{chapter}}`
`\renewcommand{\thesection}{\alph{section}}`
`\renewcommand{\theequation}`
`{\Alph{chapter}.\alph{section}.\arabic{equation}}`
- `\chapter{Upper case}`
- `\section{Lower case}`
- `\begin{eqnarray}`
`a&=&b+c\\`
`&=&d`
`\end{eqnarray}`
- (3.10) `\renewcommand{\thefootnote}{\arabic{chapter}-$\fnsymbol{footnote}$}`
- `\chapter{Silly footnotes}`
`\setcounter{footnote}{1}`
- These footnotes`\footnote{Yes, these ones.}` are very`\footnote{And I mean \emph{very}.}` silly`\footnote{Indeed.}`.
- (3.11) `\chapter{More sections}\label{thischpt}`
- `\section{The first section}\label{first}`
- `\renewcommand{\thesection}{\Roman{chapter}-\Alph{section}}`
`\section{The second section}\label{second}`
- `\renewcommand{\thesection}{\roman{chapter}/\alph{section}}`
`\section{The third section}\label{third}`
- Chapter~`\ref{thischpt}` and Sections~`\ref{first}`, `\ref{second}` and `\ref{third}` are still cross-referenced correctly.
- (3.12) `\renewcommand{\theenumi}{\Alph{enumi}}`
`\renewcommand{\theenumii}{\Alph{enumi}-\arabic{enumii}}`
`\renewcommand{\theenumiii}{\arabic{enumii}.\roman{enumiii}}`
- `\begin{enumerate}`
`\item The first item, with`
`\begin{enumerate}`
`\item a few subpoints, like:`
`\begin{enumerate}`
`\item this one,`
`\item and this one;`
`\end{enumerate}`
`\item another subpoint.`
`\end{enumerate}`
`\item The second item.`