9 Floating blocks

Often with diagrams, figures and tables, it does not matter exactly where they are in the document, so long as they are near to the point where they are first referenced. These are referred to as "floating blocks". These typically display something horizontally centred with a caption beneath it.

LaTeX provides a couple of almost identical environments for this: `table` and `figure`. We will consider `figure` here first.

Suppose we have something we want to display:

```
\begin{center}
\begin{tabular}{|c|c|}
\hline
A&B\\
\hline
C&D\\
\hline
\end{tabular}
\end{center}
```

A	B
C	D

but which we want to "float" and carry the caption "The ABCD diagram". We wrap the table's definition (everything from the `\begin{tabular}` to the `\end{tabular}` inclusive) in a `figure` environment and insert a caption with the `\caption` command:

```
\begin{figure}[hb]
\begin{center}
\begin{tabular}{|c|c|}
\hline
A&B\\
\hline
C&D\\
\hline
\end{tabular}
\end{center}
\caption{The ABCD Diagram}
\end{figure}
```

to give the table that should appear somewhere near here!

A	B
C	D

Figure 1: The ABCD Diagram

The optional argument to the `\begin{figure}` command is a list of acceptable placings in order of preference:

`h`: *H*ere.

`t`: At the *t*op of a page.

`b`: At the *b*ottom of a page.

`p`: On a *p*age dedicated to floating blocks.

If this locator is missing, a default of `[tbp]` is used.

Note that the caption was automatically numbered. If the `\caption` command is followed by a `\label` command, then the number that a corresponding `\ref` will refer to is the figure number.

A list of figures can be generated with the `\listoffigures` command. The string used to identify the figure will be the caption unless an optional argument is passed to `\caption`. (Compare this with the optional argument

passed to `\section` and its effect on `\tableofcontents` described in section 6.1.)

For example:

```
\begin{figure}[hb]
\begin{center}
\begin{tabular}{|c|c|}
\hline
W&X\\
\hline
Y&Z\\
\hline
\end{tabular}
--- This is figure~\ref{wxyz} on
page~\pageref{wxyz}.
\end{center}
\caption[The WXYZ Diagram]{Something similar
to the ABCD diagram but using the letters
W,X,Y,Z}
\label{wxyx}
\end{figure}
```

W	X
Y	Z

— This is figure 2 on page 43.

Figure 2: The ABCD diagram but using the letters W,X,Y,Z

If we now force the list of figures to be printed with the `\listoffigures` command we get:

List of Figures

1 The ABCD Diagram 42

2 The WXYZ Diagram 43

As with all cross-referencing in LaTeX this requires (at least) two runs of the program. The information is stored in a file called `wombat.lof` which

is written by `\end{document}` if a `\listoffigures` command was found during processing.

All the preceding discussion has been for the `figure` environment. There is another environment called `table` (not to be confused with `tabular`) that is identical to `figure` except that it maintains a separate count (for the purpose of numbering figures/tables) and has a few commands with different names:

tables	figures
`\begin{table}`	`\begin{figure}`
`\end{table}`	`\end{figure}`
`\listoftables`	`\listoffigures`
`wombat.lot`	`wombat.lof`