

Lesson 14: The Figure environment, the float package and Graphics

Name: _____

Many documents contain tables and figures. If you want \LaTeX to keep track of figures, say for a list of figures or tables in a thesis, then these must be treated in a special way. The general syntax for a figure or table is

```
\begin{figure}                                \begin{table}
PLACE FIGURE HERE                            PLACE FIGURE HERE
\caption{NAME}\label{FIG:xxx}                \caption{NAME}\label{TA:xxx}
\end{figure}                                  \end{table}
```

Also since figures and tables cannot break across a page they are what are called floating objects. This means that \LaTeX moves them around to wherever it thinks they should be. \LaTeX has options that are supposed to allow you to help determine where the figures float to. These are used as by replacing the `\begin{figure}` by `\begin{figure}[htp]` (which is the default), for example, if you want the figure to be *here* and at the *top* or a *separate page*. The order that you list the options is not relevant. \LaTeX claims that an exclamation mark ! such as `[!ht]` will override any of \LaTeX attempts to change the floating. I haven't tried it yet.

To me all this floating is one of the worst aspects of \LaTeX but I have learned to deal with it using a special package named `float`. To use it you put in the preamble the line `\usepackage{float}`. If you use this package with `[H]` the figure will be exactly where you put it. Options are

t	Top of page	b	Bottom of page
p	Page of floats	h	Here, if possible
H	Here, always		

Table 1: The Float Package

This table was generated using

```
\begin{table}[H]
\begin{center}
\begin{tabular}{*2{c1}}
t & Top of page & b & Bottom of page \\
p & Page of floats & h & Here, if possible \\
H & Here, always & & 
\end{tabular}
\caption{The Float Package}
\end{center}
\end{table}
```

THE CAPTION

There are a few things you should know about the caption. The general syntax is

`\caption[short text]{long text}`

The *short text* is a short title for the *list of figures* or *list of tables* pages at the beginning of the thesis or book or whatever you are typing. There should always be a short name given which is less than a line in length.

N.B. The `\label` command must come after the caption in order to function properly.

THE LIST OF FIGURES

To generate the list of figures for the TTU Thesis you would need to put in the commands

```
\listoffigures
\addcontentsline{toc}{chapter}{LIST OF FIGURES}
```

just after the `\begin{document}` statement. Similarly for `\listoftables`. These have already been put in the Template thesis file on my web page.

Generating EPS Files in Matlab and Including in \LaTeX

In Matlab type

```
x=linspace(0,2*pi);
y1=sin(x);
y2=cos(x);
figure
plot(x,y1)
axis([0,2*pi,-1.2,1.2])
set(gca,'fontsize',18)
print -deps2c sin.eps
figure
plot(x,y2)
axis([0,2*pi,-1.2,1.2])
set(gca,'fontsize',18)
print -deps2c cos.eps
```

```
\begin{figure}[ht]
\centerline{\includegraphics[scale=.5]{sin.eps}\hspace*{.2in}}
\includegraphics[scale=.5]{cos.eps}
\caption{This shows how you might include eps files}
\label{fig1}
\end{figure}
```

PROBLEM:

Generate a plot of $\sin(x)$ and $\cos(x)$ on the interval $[0, 2\pi]$ on the same figure window. Save the picture to a eps file named `sincos.eps` and give the syntax to include this picture in a \LaTeX document.

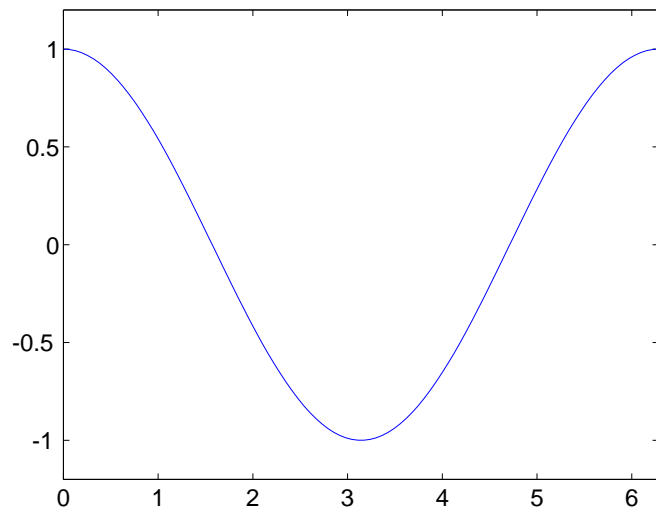
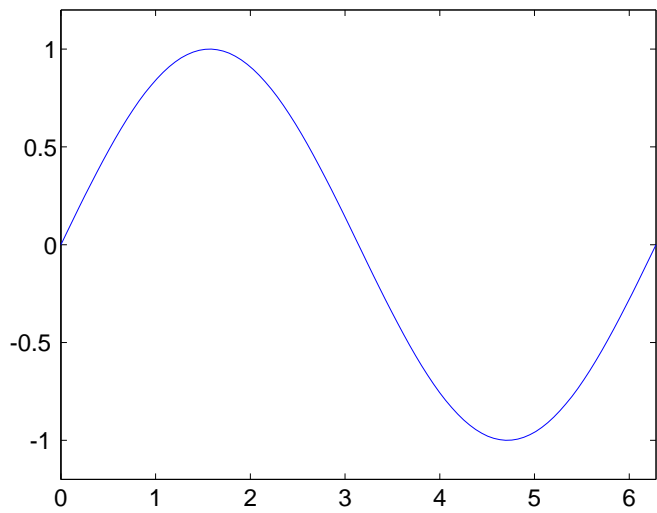


Figure 1: This shows how you might include eps files

