Mudd \LaTeX\ FAQ

June 11, 2002

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1 Introduction

This document contains questions asked on Harvey Mudd College's \LaTeX\ mailing list. Questions have been left anonymous; answers have been cited. Both questions and answers have been rephrased.

2 General

So I'm still a heathen, running Windows 98, but I wanna start playing around with \TeX. I've found a .dvi viewer for Windows that seems to work all right, but I need some way of compiling .tex files. What
is the proper command format to make \TeX (on a UNIX/Debian machine) compile the happy little .tex file? I keep getting “Undefined control sequence” errors, on things like `\documentclass{article}` and such.

That indicates you are using \LaTeX (which is \TeX plus a whole bunch of useful macros). So try

```
latex foo.tex
```

If you want to use your own machine, I’m told that MiKTeX is a nice version of TeX for Windows. See http://www.miktex.org [5]

You can also get Emacs for Windows if you want to use something other than notepad. [7]

Alternately, you can \ssh to Odin. Use your favorite text editor to create your tex. Compile it on Odin to pdf using pdflatex. Move it to your www-home directory. Open your web browser and point to www3.hmc.edu/~yourloginhere/ yourfilename.pdf. When you change something, just move it again (which is easy, just use the up arrows), and refresh the page. [4]

**Has anyone got any good online resources for “Newbie How To Use \TeX”?**

This document is extremely useful:

*The Not So Short Guide to \LaTeX 2e*

Various formats at http://people.ueb.ethz.ch/~oestiker/lshort/

Online version (HTML) at http://www.physics.udel.edu/~dubois/lshort2e/

For math stuff, I find the amstex package very useful. It comes with most \TeX versions, as does its documentation. [5]

**What \LaTeX-friendly programs do people use?**

- Scientific Word (and Scientific Workplace and Scientific Notebook) allow one to prepare mathematical files while knowing little about \LaTeX. [10]

- If you’re running some form of UNIX would be LyX. It is a WYSIWYM (What you see is what you mean) \TeX front-end that tends to do the job pretty well, albeit it’s hard to customize. [13]

- Overall I found LyX to be considerably more robust than Scientific Workplace, and I wouldn’t go back, but for those who might need help the documentation is a bit less thorough. But Scientific Workplace also has Maple built in. [1]
3 Output

I realize this is heresy, but is there an easy way to convert \LaTeX{} into a Word document?

BAD! BAD! BAD! Go wash your keyboard out with soap!
Seriously, it depends on the complexity of the document. If it's mostly running text with a bit of italic and boldface, you can probably pull it off. If it has figures, you'll probably have to put them over as gifs or something equally ugly. If it has math, you'll be really stuck.

What I would try would be to convert the \LaTeX{} into \html{}. My favorite converter is \ttw{tt}, which is on the CS department server and adds relatively little cruft. Then I'd try opening the \html{} in Word.

Disclaimer: I've used \ttw{tt}, but I've never tried this particular trick. I'm not 100% certain that you can open \html{} in Word.

The other option, which I have used, is to cut the \LaTeX{} as text and paste it into Word, then reformat by hand. Usually I do it directly out of the raw document because the formatting commands give me clues as to where to switch to italics.

It's a big pain. \cite{11}

4 Graphics

What exactly is a file of type .eps?

An \eps{} file is Embedded PostScript. \cite{18}

How do you convert a jpg or a gif to an eps?

If you are using a flavor of UNIX and ImageMagick is installed, you can use convert:

\begin{verbatim}
% convert flower.jpg flower.eps
\end{verbatim}

[18]

I am using the package graphicx for the graphics I am entering into \LaTeX{}. I use the following setup:

\begin{verbatim}
\begin{figure}[h!]
\begin{center}
\includegraphics[width=6cm]{F1M120mofit} \% This is the include command.
\end{center}
\caption{Data points plotted for NET vs. temperature for Flag 1 Module 120} \% This is the include command.
\end{figure}
\end{verbatim}

But I keep getting the following \LaTeX{} error:
! LaTeX Error: Cannot determine size of graphic in F1M120nofit.eps  
(no BoundingBox).

What does it mean?
Is there anything wrong with how I am setting up my picture environment? (wrong syntax, spelling errors, etc.)

Encapsulated Postscript (eps) files have a comment at the beginning named  
BoundingBox. It basically gives the size coordinates of the area where the figure  
appears. Apparently your file F1M120nofit.eps doesn’t have that comment.  
You can verify that fact by looking at it with your favorite pager (e.g., less).  
The program ps2epsi, if you have it, can calculate a correct bounding box. [11]  
For ther information about image files, ImageMagick’s identify program is  
useful. [7]

I’d like to make a plot and get it into an encapsulated postscript file.  
I have a nice plot in Gnnumeric and I have Gnuplot installed, however  
neither of these two options seems to be working as the first won’t  
export and I don’t know how to use the second. Any suggestions?

It is my recollection that Gnuplot is pretty straightforward to learn—half an  
hour or so with man pages. Its input format is pretty straightforward, and it  
can output raw \LaTeX\ commands, suitable for direct inclusion in a \LaTeX\ file, if  
that’s what you’re going for. [15]  
Another choice is to produce a bitmap image in Gnnumeric (assuming it can do  
that) and use the pnm tools to convert it to eps. But it’ll render badly.  
Speaking of rendering badly, using “raw \LaTeX\” output formats is usually a poor  
choice that will result in bad-looking output, due to limitations in the typesetter  
model. For example, you’re restricted to lines with only a few slopes.  
My own preference is jgraph. It’s easy to learn, produces a good graph without  
cruft, and is well suited to the UNIX environment. However, it doesn’t do  
surface plots.

How can I make graphs (as in graph theory) for use with \LaTeX?  

You can use the \texttt{ps\-\node} package as follows:

\begin{verbatim}
\usepackage{pst-node}
\begin{document}
\begin{pspicture}(0,-.5)(2,2.5)
\psframe[framesep=0.25](0,0)
% here (0,0) is the lower left corner
% and (2,2) is the upper right corner.
\rput(0,0){\circle{1}}\% circled vertex named x
\rput(2,0){\circle{1}}\% circled vertex named y
\rput(1,1.7){\circle{1}}\% circled vertex named z
\ncline{x}{y}\% draw a line from vertex x to vertex y
\end{pspicture}
\end{document}
\end{verbatim}
\begin{itemize}
\item \texttt{\textbackslash{ncline}(x|z)\textbackslash{tput}(1)}
\item \texttt{\textbackslash{ncline}(y|z)\textbackslash{trput}(1)}
\end{itemize}

The picture is in math mode (with the \[ and \] commands) so that the graphic has a place to be. The figure environment could be used as well. The resulting graph is

```
\begin{figure}
\centering
\begin{tikzpicture}
\node (x) at (0,0) {$x$};
\node (y) at (1,1) {$y$};
\node (z) at (1,2) {$z$};
\draw (x) -- node[below] {1} (y);
\draw (y) -- node[below] {1} (z);
\draw (x) -- node[below] {1} (z);
\end{tikzpicture}
\end{figure}
```

A short list of commands for drawing graphs includes:

- \texttt{\textbackslash{rput}(a,b)[]} puts something at (a,b).
- \texttt{\textbackslash{circlednode}(internalLabel){printedLabel}} prints a circle around the text \texttt{printedLabel} and remembers that node with the \texttt{name internalLabel}.
- \texttt{\textbackslash{ncline}(Label1){Label2}} draws a line between the node labeled Label1 and the node labeled Label2.
- \texttt{\textbackslash{tput}(foo)} prints \texttt{foo} below the most recently drawn line;
- \texttt{\textbackslash{taput}(foo)} prints \texttt{foo} above the line;
- \texttt{\textbackslash{tlput}(foo)} is for left;
- \texttt{\textbackslash{trput}(foo)} is for right.

This was found in the \textit{\LaTeX\ Graphics Companion}. There is a bunch more in there including directed graphs and nodes connected by springs and such. [7, 8]

5 \hspace{1cm} \textbf{Headings}

If I wanted to add information other than title, author, and date to my title page (like the class that the paper is for), how would I do so?

I've made title pages using the following. If you want more info (like the date or course or something), just add another line with `\` at the end.

\begin{verbatim}
\begin{titlepage}
\vspace*{4cm}
\end{titlepage}
\end{verbatim}
What commands would I use to modify the size of chapter and section headings?

First, you should only change the headers if you have a good reason to. The defaults are pretty decent. That said, see page 16 and pages 26-27 of *The \LaTeX\ Companion*. In the preamble of your document (i.e.: before the `\begin{document}` command) put something like the following:

\makeatletter %to make the @ symbol not cause errors
\renewcommand{\section}{\@startsection
  \section}{%the name of the section level
  1}%the number of the level (0 is chapters, 1 is sections, etc.
  0em}%the indent to the left of the heading
  \baselineskip)%the "beforeskip"---the vertical space between the
  % heading and the preceding text
  0.5\baselineskip)%the "afterskip"
  \normalfont\normalsize\itshape}%the font attributes for the heading
\makeatother %restore the @ symbol to its normal usage

The 

The after prefix is the space between the heading and the text. If it is negative, the text will appear on the same line as the heading. If it is positive then the text will appear below the heading. [7,18,9]

6 Text Properties

How can I insert source code into my \LaTeX\ document?

You use the verbatim environment and its friends:

\usepackage{verbatim}
\begin{verbatim}
... Lots of cool code
\end{verbatim}
There is \verb|verbatim| and \verb|verbatimtab|. The former ignores TAB characters, which is inconvenient for sticking in code.

You can also keep the code outside your \TeX file, which is handy if you want to be able to compile it. Use \verb|verbatim| for foo.cc to get it to slap foo.cc into your document at the right place. [11]

I want to frame some text in a box. It’s a half-page long paragraph, and I just want it to be in a little box. I’ve tried \verb|\fbox|, \verb|\frame|, and \verb|\begin{framed}| and all the other things I’ve found on Google, but none of them have produced the right effect. Suggestions?

Try
\begin{verbatimtabularx}{|X|}
\hline
blahblah
\hline
\end{verbatimtabularx}
the X means that it might wrap. [12]
Also, you could try
\begin{verbatim}
\fbox{\parbox{\linewidth}{YOUR TEXT HERE}}
\end{verbatim}

or
\begin{verbatim}
\fbox{
\begin{minipage}{\linewidth}
YOUR MULTI-PARAGRAPH TEXT HERE
\end{minipage}
}
\end{verbatim}

Neither will page-wrap in the middle of boxed text, which may or may not be a good thing. Also, there is no indenting (by default at least) in the \verb|minipage| environment.

7 Citations

I am using \TeX to create a bibliography for a report I am writing. Many of my sources are journal articles with multiple authors. When an article has two authors, I want them both listed, but when there are more than two, I want it to list et al. For example (FirstA and SecondA, 123) for two authors but (FirstA et. al., 123) for more.

The command you want to use is \verb|\shortciteA[]|{}. It doesn’t work for all bibliography styles, though.
I am working on the bibliography for a report and I need to know how to include online sources. Any ideas?

The url package (\usepackage{url}) is great for having long URLs typeset correctly. I generally use the "note" section of a Bib\TeX entry for the URL. For example:

\begin{verbatim}
@misc{foo,
  author = {fdsafds},
  note = {\url{http://...}}
}
\end{verbatim}

I don’t think Bib\TeX has a proper entry type for webpages by default. Also, I have run into a problem where a url is too long so Bib\TeX line-wraps it when making the bibliography. In doing so it adds a % sign to the end of the line, however because the url command takes everything literally, the URL winds up with a % sign in the middle of it. [7] The current standard is to use an \texttt{misc} bibttex entry. Use the url package and include the URL as the "howpublished" field. Here’s an example:

\begin{verbatim}
@Misc{Paxson97z,
  author = "Vern Paxson",
  title = "Scripts for Sanitizing \{TCPDUMP\} Trace Files",
  howpublished = "\url{http://ita.ee.lbl.gov/html/contrib/sanitize.html}",
  year = 1997,
}
\end{verbatim}

[11]

8 Symbols & Macros

The best place to find answers to any questions about symbols is the Comprehensive B\TeX Symbol List which can be found in various formats at http://www.ctan.org/tex-archive/info/symbols/comprehensive/.[5]

How would I make a registered symbol (the little $R$ in a circle that goes above something)?

\begin{verbatim}
\textregistered\$
\end{verbatim}
which makes this\textcircled{1} outta do the trick.[16]

How do you put a double-dot-thingy over a “u” for German names?

Use \texttt{\textregistered} which produces “\textregistered”. [11]

You can also get that character by typing alt + 0252 for (hold down alt button and then type in 0252) or alt + 0220 for ü and Ü respectively [3]. However, including the characters directly into the document is sometimes more readable. To do so, you must tell B\TeX what character set you are using. Include this in the preamble of your document (after the \documentclass{} line):

8
\usepackage[latin1]{inputenc}

As for actually typing the characters in, alt+nnn works in Windows. In emacs, C-x 8 " u will produce ü. In vim, Ctrl-K : u works. See the appropriate documentation for more characters. [17]

A good way to describe the sound that a ü should make is to

1. put your mouth in the shape it would be to say “oh” but
2. say “ee” instead. [14]

Can I get today’s date in a customized format? (\today seems to only give me the default format)

You can always use the \show command to see what a command does:

\show\today

Document Class: article 1999/01/07 v1.4a Standard LaTeX document class

So \month holds the month, \day the day, \year the year. so you can do: \number\month/\number\day/\number\year to get 6/11/2002 (I’m not familiar with ifcase, but it looks like it’s a way of taking a number and essentially returning a corresponding array element where the array is first \or second\or third...) [7]

I would like to display the date and time on the documents i create in \LaTeX. What commands can i use to do this?

Use the following package; I call it printtime.sty:

\%
% Idea from Mike Erlinger
%
\usepackage{calc}
\newcounter{hours}\newcounter{minutes}
\newcommand{\ftime}{% 
    \setcounter{hours}{\time/60}%
\setcounter{minutes}{\time-\value{hours} \times 60}
\newcommand{paddedminutes}{%
  \ifnum\value{minutes}<10 0\thehours\else \thehours\fi}
\newcommand{thetime}{% \themilitarytime}
\newcommand{themilitarytime}{% \findtime \thehours:paddedminutes}
\newcommand{thetimeampm}{% \findtime \ifnum\value{hours}>12 \setcounter{hours}{\value{hours}-12}% \thehours:paddedminutes PM\fi \else \ifnum\value{hours}=0 12:paddedminutes AM\else \thehours:paddedminutes AM\fi \fi}
\fi

9 Math

*How do I do a summation sigma with limits? I can only find how to get the generic sigma.*

The limits are created using subscripts and superscripts. So in math mode, you can do

\[\sum_{n=0}^{\infty}1/n^2\]

and get

\[\sum_{n=0}^{\infty}1/n^2\]

Other large operators include \texttt{\prod}, \texttt{\bigcup}, and \texttt{\bigcap}. [17]

*How do you make the evaluated from/to bar thing? Like what you get after you evaluate an integral but haven't plugged in the bounds yet.*

It's a normal bar, which can be created with either \texttt{|} or \texttt{\vert}. If you want it to scale to the size of your equation, use:
\left. \frac{x^2}{2} \right|_{x=0}^{1}

which produces

\[
\frac{x^2}{2} \bigg|_{x=0}^{1}
\]

The \texttt{\left.} creates an invisible matching delimiter for the \texttt{\bigg|} on the right side, but makes the \texttt{\bigg|} large enough to match the equation inside. Superscripts and subscripts are used to label the bounds. [17]

**How can I get the “floor” operator?**

\LaTeX{} provides the \texttt{\lfloor} and \texttt{\rfloor} commands, so you simply do \texttt{\lfloor x \rfloor} to get \([x]\). [16]

**How do I keep text from being italicized in math mode?**

\texttt{\textit{}} puts math fonts in roman (upright). \texttt{\textcal{}} puts it in calligraphic, \texttt{\textbb{}} puts it in blackboard bold, often used for \(R\) as in the set of Real numbers.

I often write something like \(\frac{xy}{x} = y\) on paper and then write a diagonal slash through the \(x\) on the top and the bottom of the fraction. How can I do that in \LaTeX{}?

There’s more than one way to do it; here is a good one:

\begin{verbatim}
\%The following is for crossing out
newbox\thecrossbox
newcount\crossboxHt
newcount\crossboxWd
newcount\crossboxDp
%
newcommand\crossboxpreamble{}
newcommand\crossbox[1]{\ensuremath{%
\setbox\thecrossbox=hbox{$#1$}
\setlength\unitlength{1pt}
\crossboxHt=\ht\thecrossbox \divide\crossboxHt\unitlength
\crossboxWd=\wd\thecrossbox \divide\crossboxWd\unitlength
\crossboxDp=\dp\thecrossbox \divide\crossboxDp\unitlength
\begin{picture}(0,0)
\crossboxpreamble
\put(0,0){\psbox(0 \the\crossboxDp\space neg moveto \the\crossboxWd\space \the\crossboxHt\space \the\crossboxDp\space add lineto stroke}}
\end{picture}\box\thecrossbox}}
\end{verbatim}

11
Then you’d just do $\text{\textbackslash crossbox}\{x\}y/\text{\textbackslash crossbox}\{x\} = y$. [7]

**How do you make a qed symbol?** (A shaded box, for example.)

If you use `amslatex`, you can just do

\begin{proof}
This, hence that, therefore the other, as desired.
\end{proof}

And you’ll get a nice italicized “Proof” label, and a black box at the end. [5]
You can use `\blacksquare`, or define `\text{\textbackslash qed to be \textbackslash blacksquare}. [2]

I want two integrals with a circle like this:

\[
\oint
\]

When I do the obvious, `\ooint`, it tells me it’s an undefined control sequence. How does one get this?

According to the *Comprehensive \TeX Symbol List*, that will work if you include the `wasysym` package. [17]
If you want your standard double integrals to look better than what this provides, you can do this:

\begin{verbatim}
\renewcommand{\int}{\int!\!\!\!\!\int}
\end{verbatim}

Also, from the *Comprehensive \TeX Symbol List*, it looks like there are other packages (tfonts and pxfonts which provide the same symbols in a nicer-looking font (i.e.: with sloping integrals). [7]

## 10 Formatting

I’m just starting out using \LaTeX, hoping to never again return to the evil that is Microsoft Word. However I’m used to working with margins all around the edge of the paper of about 0.5 inches. Any ideas as to how I might do that?

You probably want to just `\usepackage{fullpage}. Use this sparingly. Keep in mind that if you have more than about 14 words per line text becomes difficult to read. The default font size for \LaTeX is 10 points; you should use at least a 12-point font with the `fullpage` package. \LaTeX’s defaults look weird in comparison to Word’s, but compared to published text published, it is Word’s output looks grossly out of place.

Every time I have a new paragraph it is automatically tabbed over, how do I prevent this from happening?

12
The solution is twofold.  \texttt{parindent} controls the indentation of new paragraphs. You can set it with setlength:

\begin{verbatim}
\setlength{\parindent}{0pt}
\end{verbatim}

or be \TeX-lazy:

\begin{verbatim}
\parindent=0pt
\end{verbatim}

If you aren’t getting a blank line between paragraphs, you also need to set parskip:

\begin{verbatim}
\setlength{\parskip}{2\baselineskip}
\end{verbatim}

(I’m picking the length from memory; you might want only plain \texttt{\baselineskip}, or you might want to use 2.5 or 3 to make it look the way you like it.) [11]

I’m writing a letter which is just over one page.  I’d like to force \LaTeX to put it all on one page, even if the closing is near the bottom. How do I force this?

I generally deal with this by explicitly specifying the size of margins. Use as many of these commands as necessary (of course the numbers are to be adjusted), and put them after the \texttt{documentstyle} or \texttt{documentclass} command:

\begin{verbatim}
\textwidth 8.5in
\textheight 8.5in
\topmargin 0in
\headsep 0in
\headheight 0in
\parskip 0in
\end{verbatim}

[6]

How can I do double spacing with \LaTeX?

The recommended way of doing double spacing is \texttt{\linespread{1.6}}. If you want it spaced even wider than that, change the number to something larger. There’s also the \texttt{doublespace} package (\texttt{\usepackage{doublespace}}) which allows you to do

\begin{verbatim}
\begin{spacing}{2}
\end{verbatim}

\begin{verbatim}
\end{spacing}
\end{verbatim}

[7]
11 Errors

When I run \LaTeX on my documents I get the following warning message:

Underfull \hbox (badness 10000) in paragraph at lines 10--15

Underfull \hbox (badness 10000) in paragraph at lines 16--19

Actually, I get several more of them.

- What does this mean?
- Is it bad?
- If so, how do i make the errors go away?

This means that Latex was unable to properly fill a paragraph. An “hbox” is a horizontal box; in this case it’s probably equivalent to a single line of text. Look at lines 10–15 of your source. Then look at the corresponding section of your output:

If it looks like this

then you’ve got an underfull hbox. If the badness is small (e.g., 2345), then it probably won’t look too ugly. A badness of 10000 usually looks really ugly.

There are several cures. The first is to use \sloppy to give \LaTeX more flexibility:

\{
\sloppy
This is my text that generates a nasty message
\}

Note well the blank line at the end: the curly braces must enclose the end of the paragraph, including the blank line, for this trick to work.

There’s also a \sloppypar directive, but I’m not expert in its use.

If \sloppy doesn’t work, you usually need to figure out where some hyphenation can be inserted using -, which tells \LaTeX that it is ok to line-break at that point in a word.

In some situations, underfull (and overfull) hboxes aren’t curable. Both Knuth and Lamport suggest that you should then rephrase your sentence(s) to make it more formatting-friendly. That’s a good idea, but if it’s not possible (e.g., you’re quoting somebody else) then sometimes you just have to suffer. [11]
References


