

# L<sup>A</sup>T<sub>E</sub>X– Week 4

## 1 New Definitions in the Preamble

Sometimes there are certain L<sup>A</sup>T<sub>E</sub>X commands that one types over and over again in a certain article. If those commands are particular unwieldy or irritating to type, you can shorten them by making up your own abbreviation. The command is `\newcommand` and it goes in the preamble. The format is `\newcommand{\abbreviation}{\what it abbreviates}`. For example, the following are from my preamble in a document for a Number Theory class:

```
\newcommand{\ds}{\displaystyle}

\newcommand{\zzz}{\mathbb{Z}}    %writes the symbol for the integers
\newcommand{\nnn}{\mathbb{N}}    %writes the symbol for the naturals
\newcommand{\rrr}{\mathbb{R}}    %writes the symbol for the reals
\newcommand{\qqq}{\mathbb{Q}}    %writes the symbol for the rationals
```

Now, in the body, you can type the abbreviated command. When L<sup>A</sup>T<sub>E</sub>X processes the document, it will replace the abbreviated command by exactly what appears in the second brackets. So, whenever I type `\ds`, L<sup>A</sup>T<sub>E</sub>X just treats it as if it really said `\displaystyle`. Notice that all of the commands above are things that belong in math mode. That means I can use those abbreviations only in math mode. Now, in the body I could write

For all  $p \in \mathbb{N}$ ,  $\frac{p-1}{p} = n$ .  
Furthermore,  $\ds \sum_{\theta \in \mathbb{R}} \theta = \infty$ .

---

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You can also write abbreviations for commands that have variables. You list the number of variables in square brackets and refer to them as #1, #2, etc.. For example,

```
\newcommand{\supersum}[3]{\$#1+#2^2+#3^3+#1#2\$}
```

If I type

`\supersum{a}{b}{\pi}`

I would get

---

$$a + b^2 + \pi^3 + ab$$

---

Here is a silly example:

```
\newcommand{\faves}[5]{I love \textbf{#1}, \textit{#2}, \textsf{#3},
\textsl{#4}, \textsc{#5}}
```

Then in the body I could type

```
\faves{Ice Cream}{Chocolate}{Peanut Butter}{Veronica Mars}{Kittens}
```

---

I love **Ice Cream**, *Chocolate*, Peanut Butter, *Veronica Mars*, KITTENS

---

## 2 Features of WinEdt

I'm a Mac user, so I am not familiar with the features of WinEdt. Nevertheless, here are a few things that I have found.

### 2.1 Insert

Under the menu Insert, you can choose to insert an array, matrix, table, or equation. You can also insert an itemized list, enumerated list, or cases command. When you select any of these, WinEdt inserts the appropriate Latex command wherever your cursor is. There are red asterisks in the areas where you need to add information. Under the Font command, you can insert the Latex commands for boldface, italics, and so on. Under the Latex command you can insert the commands for `\ref` and `\label`

### 2.2 Document

When you have a new blank document, you can start by clicking on Document → New Document. Select Latex:AMS Article and it will start a file for you with the preamble typed already.

Under Document → Current Work (Samples), there is a skeleton file for several types of documents. Try looking at these. In my opinion, they have almost too much information, but you might delete some of the stuff and just keep the things you like.

## 2.3 The Toolbar

On the toolbar (where the Latex and magnifying glass buttons are), there are buttons for various Latex math symbols. If you click on the big  $\Sigma$ , you will get another toolbar with the majority of math symbols you need. Then if you click on any of these buttons, it will insert the command into your document. Note that it does not insert the \$ dollar signs, you still need to type those. Experiment with the buttons here.

## 3 Features of TexShop

Again, I am not really an expert on these programs, but I can tell you about the commands that I use frequently.

### 3.1 Window

Under the Window menu option, click Show Toolbar or Hide Toolbar to view the toolbar at the top of the .tex file. I recommend showing the toolbar, as it has some useful features. Once the Toolbar is showing there are several useful things:

1. The Typeset button. Hit it with your mouse to run Latex.
2. The Tags menu. You can set tags in your document so that you can quickly find your way back to a particular spot. You set a tag by typing %: at the very beginning of a line. Anything after the tag is a comment and will be ignored by Latex.
3. The Templates menu. TexShop has a couple of predefined templates that can get you started. When you have a brand-new empty document, select the Template menu and choose one the templates. It will insert the `\documentclass` command along with a bunch of other stuff that you may or may not want. You can also write your own templates and save them in the Template folder so that they will appear under the Templates menu. (On my computer the templates folder is at Faculty/Library/TeXShop/Templates.)

Click Latex Panel or Matrix Panel for a panel that comes up with many commonly used commands. If you use your mouse to click on any of these, TexShop will insert the  $\LaTeX$  command into your file wherever your cursor is. This is particularly useful when you have forgotten the command for something, or for arrays, in my opinion.

## 3.2 Preview

The commands here all have to do with how you want the PDF file to be displayed.

## 3.3 Macros

These are extremely useful. On the lower part of the menu are choices for things you might like to type. For example, under Text Styles, you can choose Typeface, Size, Style, and Underline.

## 4 Exercises

**Exercise 4.1** Choose a symbol or expression that you use very frequently in either your thesis work or your classes. For example, I used the symbol  $G^\#$  or  $H^\#$  a lot. Make an abbreviation and a newcommand for your commonly used expression.

**Exercise 4.2** Use the features of WinEdt or TexShop to find the following symbols:  $\star$ ,  $\otimes$ ,  $\zeta$ .

**Exercise 4.3** Use Google to find out how to type:  $\blacklozenge$  and  $\underbrace{a + b + c + \cdots + z}_{26}$