LaTeX Examples

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1 General

1.1 Outline

The section and subsection commands are used to make the sections and headers. For example, "General" is a section, and "Header section" and "Outline" are subsections.

1.2 Paragraphs

A new paragraphs can be created simply by creating two blank lines between between the text. For instance, this paragraph is ended by hitting "enter" twice (see the .tex document)... This is not a new paragraph...

But this is a new paragraph. If an extra space is desired between paragraphs, use the double-backslash command and hit "enter" twice...

The PDF will now insert a space between the last paragraph and this one.

To make a particular paragraph have no indentation, use the command \noindent, as in this paragraph.

Generally, lots of extra spaces won't affect the output text in the PDF. A new page can be created using the command \pagebreak.

1.3 Spacing

Horizontal text can be inserted in text using the \hspace{0.3cm}   command. The argument in the command can be changed, of course, to be larger or smaller, i.e. it can be 0.1cm, 2.5cm, 1.3in, etc. The command \vspace{1.1cm}

works in a similar way. LaTeX will accept specified lengths in cm, and mm, among a few other options.

1.4 Text

Text can also be manipulated using commands. For example, use the command \emph to *emphasize* (italicize) text. *There are a few ways to italicize text.* {Braces} are often used to capture what the command acts on. Similar to italicizing, text can also be **bolded** in **multiple ways** or text can be colored. You can even create your own colors... this is "myRed". You can also `type like a typewriter`.

Text size can also be made tiny, scriptsize, footnotesize, small, large, Large, LARGE, etc.

1.5 Lists

The three preceding subsections are...

- Spacing

- Text

- Macros

Lists use the `itemize` environment or, if you want things numbered, `enumerate`:

1. Spacing

2. Text

3. Macros

1.6 Special characters

LaTeX code uses a lot of special characters, which means if you want to put these characters in your text, you must *escape* the characters from their usual purpose. For instance, each of the following commands requires a backslash to precede them to show up: #, $, {, }, &, %, _. \ and ~ take a little more fussing. Greek letters and symbols will be introduced in Section 4.

2 Tables

2.1 Basic tables

A basic table...

Left	Center	Right
1	2	3

To center a table, create a centered environment around the table:

	Estimate	Std. Error	t value	Pr($>$|t|)
(Intercept)	-0.2852	0.8434	-0.34	0.7452
x	0.4192	0.1499	2.80	0.0266

Maybe you also want to add horizontal and vertical dividers...

	Estimate	Std. Error	t value	Pr($>$|t|)
(Intercept)	-0.2852	0.8434	-0.34	0.7452
x	0.4192	0.1499	2.80	0.0266

2.2 Captions and referencing

	Estimate	Std. Error	t value	Pr($>$|t|)
(Intercept)	-0.5758	1.4528	-0.40	0.7056
x	0.3775	0.1971	1.92	0.1039
z	1.4042	1.7357	0.81	0.4494

Table 1: Neither x nor z were found to be statistically significant.

You can also *automatically* build in references to tables (and figures, as shown later). For instance, the table below is Table 1. If it's table number were to change, the table number would update automatically after compiling the .tex document twice.

See `latexTemp.tex` for additional comments on references.

2.3 The R package, `xtable`

For R users who want to put R output into LaTeX, the package `xtable` is very useful:

```
> library(xtable) # to download the package, use install.packages('xtable')
> x <- 1:9
> z <- rnorm(9)
> y <- x/7 + z*2 + rnorm(9)
> xtable(summary(lm(y ~ x+z)))
[... a bunch of output that can be copied/pasted into LaTeX ...]
```
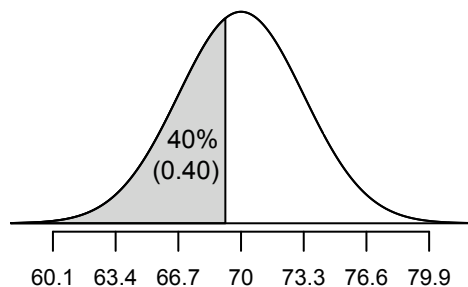
The resulting table, directly copied/pasted from R: This can also be used for matrices,

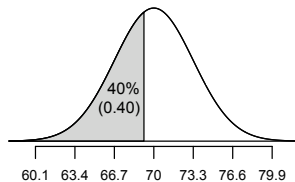|	Estimate	Std. Error	t value	Pr($>$|t|)
(Intercept)	-0.1563	0.6243	-0.25	0.8107
x	0.1094	0.1145	0.96	0.3760
z	2.6170	0.4308	6.08	0.0009

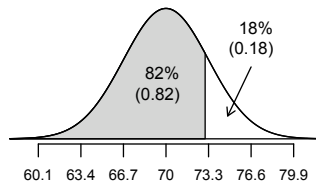data frames, and some other R objects.

3 Figures

3.1 Basic figures

Basic figures are made using the \includegraphics command. The size can also be controlled via an optional `space` argument.

A figure can easily be centered in the same way a table was centered:

4

82%
(0.82)

18%
(0.18)

60.1 63.4 66.7 70 73.3 76.6 79.9

3.2 Captions and referencing

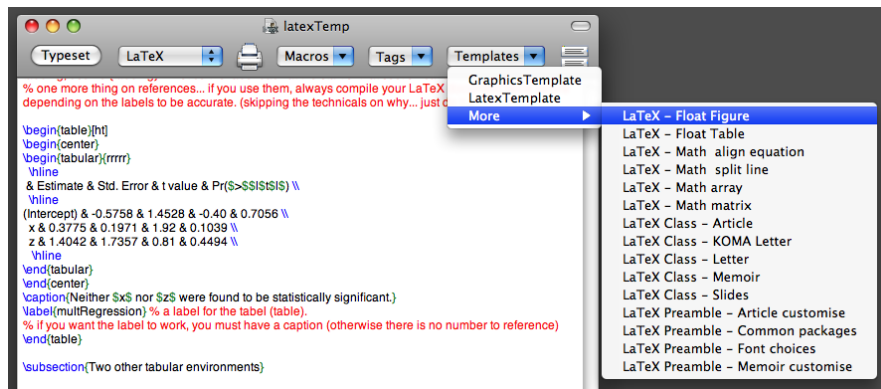Like tables, figures can also be "floated" and have captions/labels.

Figure 1: Where to find your figure template.

3.3 Keeping organized

It is highly recommended that figures are organized into folders. This will keep the main folder from getting cluttered with lots of image files, like in Figure 2. Figure 3 shows a much better organization structure for the document figures.

4 Math

4.1 Math in text

LaTeX makes it easy to add Greek letters like α, ζ, μ, etc. into text. In the same way, equations can be added easily as well: $y = x^3$, $\sum z^j$, $x_1 + \cdots + x_n$.

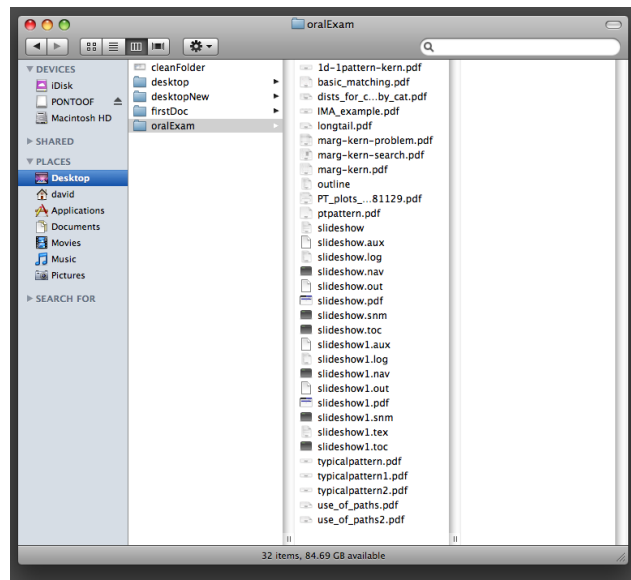Based on how α was created, how would you think to create the Greek letter beta?

Figure 2: Don't do this. And name your files more carefully than this... "slideshow" is not specific.
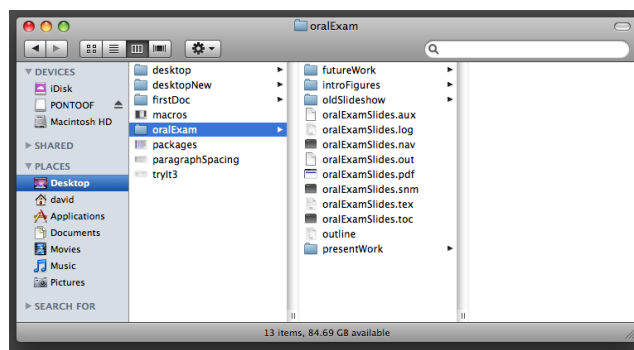

Figure 3: Organize your files more like this.

4.2 Hats, bars, and other modifiers

Adding a bar to x is easy via the bar command in math mode: $\bar{x}$. Making any mathy symbols always requires being in math mode.

The LaTeX and Matrix Panels have a large number of common symbols, letters, etc. and can be accessed by either `alt-command-[dash/underscore key]` or `alt-command-[+/= key]` in TeXShop or by navigating to them in the menu (see the "Window" menu in TeXShop). Some letters/symbols/etc that you can create...

$$\hbar \imath \jmath \ell \Re \Im \emptyset \infty \partial \nabla \triangle \forall \exists \sharp \top \perp \dagger \ddagger \sum \prod \int \oint \bigcap \cap \bigcup \cup \biguplus \bigoplus \bigotimes \bigodot \hat{a} \bar{a} \tilde{a}$$

$$\alpha \beta \gamma \delta \epsilon \varepsilon \zeta \eta \theta \iota \kappa \lambda \mu \nu \xi \pi \varpi \varrho \sigma \varsigma \tau \upsilon \phi \varphi \chi \psi \omega$$

4.3 Equation environment and referencing

Equations can also be put on their own line using the equation environment:

$$A_{b_{ik}} = \sum_{l=1}^{k} \sum_{j=1}^{i} \gamma^{\alpha_{b_{jl}}} \tag{1}$$

Just like tables and figures, equations can also be referenced, such as Equation 1.

If you do not want a number assigned to your equation, use the `eqnarray*` environment:

$$A_{b_{ik}} = \sum_{l=1}^{k} \sum_{j=1}^{i} \gamma^{\alpha_{b_{jl}}}$$

One more example below in Equation 2...

$$\sum_{k=0}^{\infty} 0.5^k = \frac{1}{1-0.5} = 2 \tag{2}$$

4.4 Arrays

Arrays are easily constructed using the Matrix Panel:

$$\begin{pmatrix} \sigma_1^2 & \sigma_{1,2} & \sigma_{1,3} \\ \sigma_{2,1} & \sigma_2^2 & \sigma_{2,3} \\ \sigma_{3,1} & \sigma_{3,2} & \sigma_3^2 \end{pmatrix}$$

Array construction is essentially identical to tables, except now it is easy to insert mathematics.