Summary of LaTeX Features
(following "LaTeX for Beginners")

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Contents

1   Introduction

So, this document accompanies the pdf "Latex for Beginners" which can be found at the following link: www.google.com. This document will generally follow the same order as the pdf. Any special commands will be included at the end. General structure of the supplemental PDF:

- Creating a Title
- Sections
- Labelling
- Table of Contents
- Typsetting Text
- Lists
- Comments & Spacing
- Special Characters
- Tables
- Figures
- Equations
- References
- Special Commands (kjg own section)

So, let's get started.

2   Document Structure

2.1   Basic document

Each document requires a few things, given as examples below (in order of appearance):

- \documentclass[a4paper,12pt]{article} : defines what the document's like (*)
- \usepackage{chngcntr} : imports helpful packages
- \counterwithin{equation}{section} : enables numbering on figures, etc
- \begin{document} : end of preamble, start of main body (*)
- \section{SectionName} : section title
- \label{SectionLabel} : linkable / reference for each (sub)section
- \subsection{SubsectionName} : subsection title
- \end{document} : end of body, start of post-body (*)

Each of these are important for the document to function properly, but only three are essential [marked with (*)]. The document can be roughly divided into 3 parts: preamble, body, and post-body (kjg name). the preamble is for package loading and initializations; the body is for actual content, and the post-body is for comments / non-printed stuff (anything can be written here, not put in final document).

2.2   Title Page / Initial Commands

Main commands that are needed:

- \title
- \author
- \date
- \maketitle
- \pagenumbering
- \maketitle
- \pagenumbering{gobble}

3 Basic Formatting

So here I am with my own text. Please see section **??** on page 2 to blah blah blah. Yo, this color text is fire. lol. Here's a list of font effects:

- textit = *italics (*sl for slanted)*
- textbf = **bold**
- textsc = SMALLCAPS
- texttt = `teletype`
- {color{*red*} ...} = color

3.1 Lists & Special Characters

Alright, here we're gonna get serious about lists. here we go. numbered lists:

1. one
2. two

    (a) sublist a (note: this is a pain and the separation is still there

    (b) sublist b

3. three

Etiam id interdum sem. Proin tempor diam urna, non ultricies est rhoncus ac. Etiam id interdum sem. Next, bulletlists:

- one
- two

Note that there are also special characters that have certain meanings in text. quick check for German: ä ö ü ß . seems like a special package is required, but nothing too bad.

however, there WILL be issues when trying to use a certain set of special characters:

Item #1A\642 costs \$8 & is sold at a ˜10% profit.

Etiam id interdum sem. Proin tempor diam urna, non ultricies est rhoncus ac.

3.2 Tables, Figures & Equations

Alright, in this section, really want to focus on making good looking figures in our data.

3.2.1 Tables

Tables by default are drawn without horizontal and vertical lines...

Table 3.1: Mathematical Symbols

Name	Value	Symbol
pi	3.14	π
e	2.72	three
phi	1.62	ϕ

Next, we're gonna spend some time figuring out how to create a table but with numerical data. So, the below is necessary plus some preable lines. Note how you need to place horizontal lines both in the "main" area as well at either top and bottom end. NOTE: tables may be placed on next page, depending on amount of space available.

Table 3.2: Random data

Time (s)	Zeroed time (s)
43.97	0
44.01	0.04
44.04	0.07
44.07	0.1

3.2.2 Figures

This section to cover how to make figures, which require images to be loaded outside of the file.
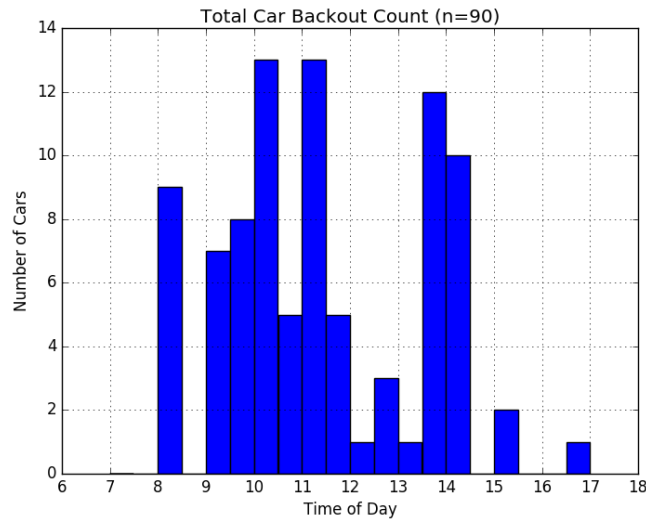

Figure 3.1: Loading an image from a subfolder

Not bad, alright so this seems to work nicely. Note the two extra lines that are needed in the preamble to ensure that per-section numbering is used. BUT WAIT, THERE'S MORE: do you want beautiful, zoomable, non pixelated images? then save your graphs to pdf, then import them like so:

3.2.3 Equations

Alright, now for one of the last special items that interrupt body text: equations. "Math mode" is entered / exited when using a dollar sign, "$". For example, this equation is in-line: $f(x) = x^2$. This next equation has it's own line:

$$f(x) = x^3$$

Finally, if we want to add a caption number, we do like so (newline not required):

$$A(r) = \pi/4 * d^2 \tag{3.1}$$

Note that in order to achieve a (section.equation) format, we need to add more to the preamble. if we want to have multiple equations:

$$a = b + c \tag{3.2}$$
$$= y - z \tag{3.3}$$
$$\frac{d(x)}{dt} = \ddot{x} * t \tag{3.4}$$
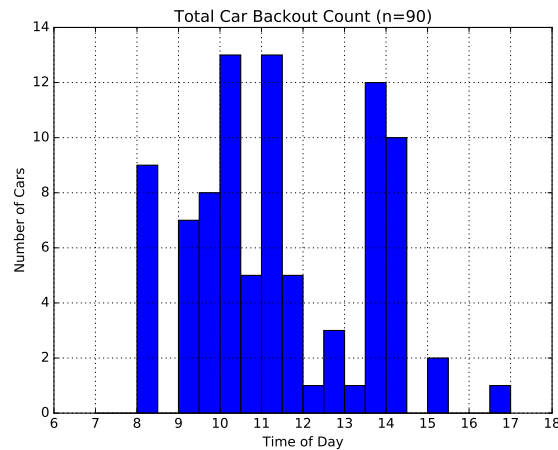$$v_{esc} = \sqrt{\frac{2GM}{R}} \tag{3.5}$$

3

Figure 3.2: Just look at that *NICE* quality.

$$\bar{x} \;=\; \frac{1}{n}\sum_{i=1}^{n} x_i \tag{3.6}$$

$$\frac{\sin(x)}{\cos(x)} \;=\; \tan(x) \tag{3.7}$$

4 Importing *.tex files for longer documents

This section to be covered by an imported document. This is the start of the remote section. note that the text begins immediately where the \input command is given. We can treat this section just like any other. The other method to use is \include, but the big difference here is that it adds a page break. that's not really necessary until you're writing book-length items. with \input, you can pretty much treat it as if it were part of the main document, such as with references:

- Table 3.1 exists behind this document

- Subsection 5.2 exists ahead of this document

- three

Alright, end of remote section. This text is now part of the main document again. notice how close "This" is to the link

5 References and Such

So, at this point have about 70% of the report able to be written. In order to create a set of references (and to cite them), we need a BibTeX file. We eventually want to make a citation, such as to J. Redmon's paper [5]. Note, however, that getting a bibliography to work is a MASSIVE pain in the ass:

1. have your document more or less written out
2. insert your references info wherever you
   want it, usually at end (see below in .tex file)
3. refer to your *.bib file in bibliography
   WITHOUT the file extension

4. do some weird mumbo jumbo where you first typeset as pdfLaTeX, then BibTeX, then back to pdfLaTeX (and rerun typeset as pdfLaTeX a few times)
5. then... it should work... ?
6. OH DON'T FORGET THE LUCK!

MAN WTF NOW THIS LIST WAS OVERRUNNING ITS MARGINS INTO THE OTHER COLUMN????

In any case, let's cover some of the way to cite what we want. the first thing we're gonna cite is this weird ass article, called ahu. ahu to you, [2]. Love ya. anyway, now we move on to [1], who probably said some really interesting things, but i haven't read it. in any case, notice that articles aren't included unless you actually reference them. and always repeat the above steps when reloading your references: while in your *.tex file: typset as pdflatex, typset as bibtex, then typeset multiple times as pdflatex.

Next, we're gonna cite two articles that seem to just be different pages of the same thing: [3] and [4]. Now, if we wanted to refer to them together, we would refer to them in the same cite tag... no? we'd say we're talking about [3, 4].

oh, another thing to note: the references are not in the same order as the bib file. this means that at compilation time, everything is put into some sort of... alphabetical order? not sure.

5.1   Intra-Document Hyperlinks

So, we want to refer to other places in the document, but what good are these references if we can't even make them hyperlinks? Let's see here: I want to go to one of the first sections, so please see Section 5.2.

UPDATE: wow, ok all you need to do is just import the package "hyperref", and you're done...

Now, another thing we'd probably like to do is arbitrarily link to other things, so why not also use the hypertarget tag: i want to return to this word, and i can refer to it later using the `hyperlink` tag to go to it. Last test, can i go back to a table by refering to its caption? See Table 3.1.Yep, it works.

BUT DOES IT THOUGH?

Lorem ipsum dolo. Today's date: January 15, 2019.

5.2   super duper

Mauris iaculis id magna

5.3   another1

Mauris iaculis id magna

5.4   another2

Mauris iaculis id magna

5.4.1   another another

Mauris iaculis id magna

another still   Mauris iaculis id magna.

5.5 another3

Mauris iaculis id magna.

References

[1] Charalambos D. Aliprantis and Kim C. Border. *Infinite Dimensional Analysis*. Springer, Berlin, 1994.

[2] Leonid Hurwicz Kenneth J. Arrow and Hirofumi Uzawa. Constraint qualifications in maximization problems. *Naval Research Logistics Quarterly*, 8:175–191, 1961.

[3] Eric S. Maskin. The theory of implementation in Nash equilibrium: a survey. In Leonid Hurwicz, David Schmeidler, and Hugo Sonnenschein, editors, *Social Goals and Social Organization*, pages 173–204. Cambridge University Press, 1985.

[4] Eric S. Maskin. The theory of implementation in Nash equilibrium: a survey. In Leonid Hurwicz, David Schmeidler, and Hugo Sonnenschein, editors, *Social Goals and Social Organization*, pages 173–204. Cambridge University Press, 1985.

[5] Joseph Redmon, Santosh Divvala, Ross Girshick, and Ali Farhadi. You only look once: Unified, real-time object detection. In *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2016.