Title

Name

April 23, 2008

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1 Overview

The purpose of this document is to give a quick overview of the basics needed to create reasonable LaTeX documents. It is not the goal of this document to approach completeness or even to give a rigorous treatment of LaTeX, but rather to provide a series of examples that will quickly allow someone to create reasonable looking LaTeX documents. LaTeX is more of a "learn as you go" kind of system. That being said, you should know that LaTeX is extremely powerful and it should be possible to do almost anything you can think of. Furthermore, in most cases, you can find a package that will suit your needs in this regard.

I recommend that you use WinEdt to edit documents and that you use MiKTeX to produce documents (e.g., in pdf or ps form).

(Note that I like to add comment-level separators to LaTeX documents. I do this because it helps me visually parse raw LaTeX documents.)

2 Fonts

Fonts can be altered in a variety of ways. Some examples include: Code is oftentimes denoted using `this` font. Emphasis is also *very* useful, but not as **dramatic** as bolded font. Of course, underlining is also possible.

One can even change the size of fonts. I have found that tiny fonts can be hard to read. Fonts that are simply small are a bit better. While huge fonts are "out of control"[1]. Overall, changing the size of a font should be avoided.

And finally, these things can be ***combined***.

3 Basic Layout

Some basic layout mechanisms include: *boxes*, *minipages*, *centering*, and a variety of spacing commands.

3.1 Box, Minipage, and Center

The command is quite useful for enclosing elements within a box. This can be applied to tables, but does not work very well for paragraphs.

Text can also be centered.

The minipage is a very useful mechanism for grouping portions of a LaTeX document. For example, in a table a minipage can be used to put a paragraph text within a cell. See Section 4.2 for an example of this.

> This text is part of a minipage whose width is 3.5 inches. This minipage can be placed in a variety of locations, including in the cell of a table. Furthermore, the minipage can be enclosed in an fbox.

3.2 Spacing

There are a variety of commands that can be used to control both horizontal as well as vertical spacing. The commands I use most are: bigskip, medskip, smallskip, vspace, hspace

The command will insert 5 mm of horizontal space. The command

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[1]Notice how double open/close quotes are denoted in LaTeX

will insert 25 mm of vertical space. The skip commands can be used to insert small amounts of vertical space. The bigskip command

inserts this much space, while the medskip command

inserts this much space.

4   Basic Structures

There are a few basic structures that are useful for creating documents: lists, tables, and figures.

4.1   Lists

Lists come in two basic flavors: enumerate and itemize.

- The first item.
- The second item.

1. The first enumerated item.
2. The second enumerated item.

4.2   Tables

Tables can have one or more columns and rows/columns can be separated by lines. A newline symbol can be used to terminate the row of a table.

Title of My Table		
Column 1	Column 2	Column 3
x	y	z

Cell contents can be justified either left (l), right (r), or center (c). Cell contents can also be separated horizontally by including the vertical bar | in the table template.

| gas	$ 45.00
airfare	$1645.00
Total	$1690.00

5   Math

One of the big strengths of LaTeX is its math display capabilities. Here I just touch on the absolute basics. First, a math environment can be created by enclosing text with the dollar sign. For example, $x + y$ is a math environment. Basic capabilities include subscripts x_{sub} and superscripts x^{super}. One can also do sub-sub scripts $x_{y_{sub}}$ though care should be taken. Similarly, super-super scripts can also be created.

Note that text in a math environment is slightly different from emphasized text: $different$ versus *different*. Also note that in a math environment spaces are largely ignored $helloworld$. However, you can force a space with a backslash as follows: $hello\ world$.

6   Graphics

Graphics can be included in a variety of ways. The way I use most often is through the includegraphics command.
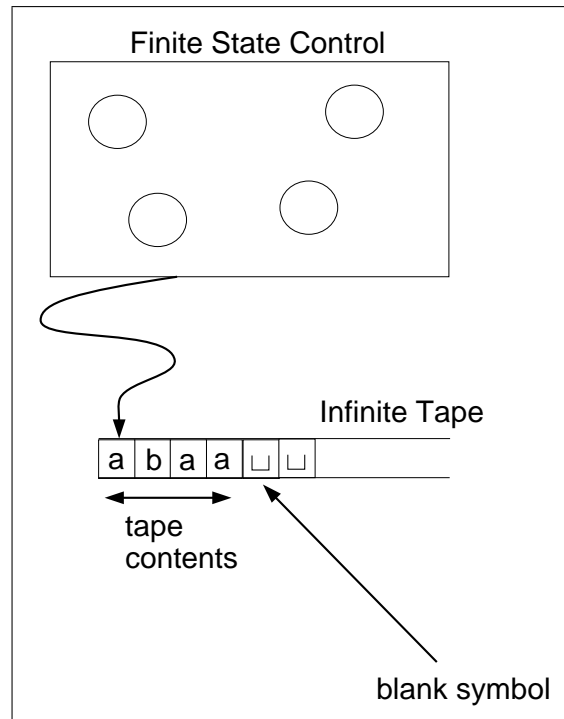
Typically, I produce figures in pdf format using mayura draw. However, note that other formats are also possible.

7   Cross-referencing and Citations

Labels can be assigned to a variety of constructs. For example, figures and sections typically will have labels associated with them. These labels can be used when referring to the construct. For example, this is how I would refer to Section 1.

This approach to referencing is nice, because it lets you restructure a document (e.g., rearrange the order of sections, etc.) without disturbing the references.

Please note that LaTeX compilation requires several passes (i.e., compile twice) in order to get cross-references resolved.

The use of citations (i.e., references to publications and such) is also supported in a very powerful manner. Citing is easy [2] and can be accomplished using the cite command. The best way to manage a bibliography is to have citation information in a separate file with a .bib extension. Note that you will need to first compile the LaTeX source document, then run the bibtex command, then compile the LaTeX source twice.

References

[1] C. S. Horstmann and G. Cornell, editors. *Core Java 2. Volume I – Fundamentals.* Sun Microsystems Press, 2005.

[2] G. Kniesel. A Logic Foundation for Conditional Program Transformations. Technical Report IAI-TR-2006-1, Computer Science Department III, University of Bonn, January 2006. ISSN 0944-8535.

[3] V. Winter and J. Beranek. Program Transformation Using HATS 1.84. In R. Lämmel, J. Saraiva, and J. Visser, editors, *Generative and Transformational Techniques in Software Engineering (GTTSE)*, volume 4143 of *LNCS*, pages 378–396, 2006.