

# L<sup>A</sup>T<sub>E</sub>X

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## Abstract

A brief introduction to L<sup>A</sup>T<sub>E</sub>X

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## 1 Overview

T<sub>E</sub>X is a typesetting language developed by Donald Knuth. L<sup>A</sup>T<sub>E</sub>X is a set of macros and extensions for T<sub>E</sub>X developed by Leslie Lamport.

This is going to focus on the basics of using L<sup>A</sup>T<sub>E</sub>X. The goal being not comprehensive but just enough to get you started.

## 2 Links

<http://web.mit.edu/answers/latex/>  
<http://www.iam.ubc.ca/~newbury/tex/title.html>  
<http://www.math.uiuc.edu/~hildebr/tex/course/intro2.html>  
<http://www.giss.nasa.gov/latex/>

## 3 Commands

This section explains how to run  $\text{\LaTeX}$  or  $\text{PDF}\text{\LaTeX}$

### 3.1 Unix

Under Unix we have several variants of tex the tetex distribution is the most common ( right now ). Typically under linux, we use latex. I have an example here using a file named sample.tex.

```
latex sample.tex
```

This will create a file named sample.dvi, which can be viewed in xdvi.

```
dvips sample.dvi
```

This command will convert the dvi into postscript and send it to the printer. There are options to convert dvi files to pdf ( many linux systems have a shell script called dvi2pdf ).

### 3.2 Win32

I tend to use pdflatex under cygwin, there is also a standalone free version called MikTeX. The following command directly generates a pdf file.

```
pdflatex sample.tex
```

### 3.3 Document Preparation

The number of times you need to run latex ( or pdflatex ) depends on what features you are using in the document. Tables require an extra pass , adding a table of contents does too, an index would add one pass also. This document took 3 times ( the base plus the tables, plus the table of contents ).

### 3.4 Fonts

You may want to be aware that the Unix way tends to create pdf files with postscript fonts, and the win32 way uses truetype fonts. Postscript fonts may look really bad on your display unless you zoom in, they print fine either way.

## 4 Math

There are several ways to enter math mode, the inline mode is done by using  $$  equation  $$ . Display mode is surrounded by  $$  , or by  $$   $$ . Display mode puts the equation on its own line. To show  $x$  squared inline in  $$  you just type  $$   $$ . Here it is in display mode

$$x^2$$

and again

$$x^2$$

which mode you use will depend on how you want to display the equation.

You can do very complex equations, here are some examples.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\sum_{k=1}^n k = \frac{n(n+1)}{2}$$

$$\int_{x=1}^n \frac{2yx}{2} dx$$

$$\lim_{x \rightarrow \infty} f(x) = 0$$

Math mode has no whitespace by default so you have to escape spaces with

Greek letters are easy to display, while in math mode just escape the letter name in either case , for example  $\Theta$  is just  $\backslash\Theta$ , and  $\theta$  is  $\backslash\theta$ .

## 5 Tables

Tables are another thing that  $$  does extremely well. There are several ways to format tables, but I am going to use the standard table environment.

Here is a table for my current class schedule.

Class	Day-Time	Room
CSCI 1620-005	MW 12:00-1:15	PKI 359
CSCI 2840-001	MW 1:30-2:45	PKI 261
CSCI 1620-001	MW 4:00-5:15	PKI 263
CSCI 1620-002	TR 12:00-1:15	PKI 359

Here is the same table with outlining.

Class	Day-Time	Room
CSCI 1620-005	MW 12:00-1:15	PKI 359
CSCI 2840-001	MW 1:30-2:45	PKI 261
CSCI 1620-001	MW 4:00-5:15	PKI 263
CSCI 1620-002	TR 12:00-1:15	PKI 359

## 6 Environments

There are many named environments in L<sup>A</sup>T<sub>E</sub>X, too many to list them all. Here are some examples.

Here is the enumerate environment.

### Short Answer

Five(5) points per question.

1 What are the numeric values of true and false?

2 What is a class?

### True - False

Three(3) points per question.

1 \_\_\_ A constructor is called any time an instance is created.

2 \_\_\_ The copy constructor is used to perform call by value.

3 \_\_\_ The function isdigit is used to copy a string.

I am using the verbatim environment to show the above example.

```
\def\sblank{\underline{\ \ \ \ \ \ }}
% you can define your own symbols, in this case \sblank
\subsection*{True - False}
Three(3) points per question.
\begin{enumerate}[1]
\item \sblank A constructor is called any time an instance is created.
\item \sblank The copy constructor is used to perform call by value.
\item \sblank The function isdigit is used to copy a string.
\end{enumerate}
```

Tabs don't expand correctly in verbatim, so if you are working on code , you should make sure you use spaces not tabs.

## 7 Special Characters

Some characters # \$ % & - { } must be escaped to display them , to do this just place a \ prior to them. In order to escape the \ you need to be in the verbatim environment. For this I used the inline verbatim which looks like this:

```
\verb!\!
```

The ! is the delimiter I am using, you can use any character that does not require escape.

There are several other special character as well, here are some examples : ñ ó è ô ü ö ç ‘? ‘! ©£†, and here are the latex commands to create them :

```
\~{n} \’{o} \’{e} \^{} \“{u} \={o} \c{c} ‘? ‘!  
\copyright \pounds \dag
```