

Introduction to LaTeX

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1 Introduction

From the document “Quick Guide to \LaTeX ” by Dave Richeson :

“ \LaTeX (usually pronounced ”LAY teck,” sometimes ”LAH teck,” and never LAY tex”) is a mathematics typesetting program that is the standard for most professional mathematics writing. It is based on the typesetting program TEX created by Donald Kruth of Stanford University.”

1.1 Why use Latex?

1. It produces beautiful end products that includes multiple mediums (words, equations, graphs)
2. Allows more systematic formatting
3. Its the standard in the economics profession

2 Set Up

Today I am going to walk you through a typical document that I use either for problem set, journal article, or a presentation. And at the end of this session you will replicate a document before exiting.

Steps:

1. Choose the type of file you want to produce. For example you can do an ”article” or ”presentation” file.

```
\documentclass[12pt]{article} --> Problem Sets and Papers  
\documentclass[twoside,twocolumn]{article} --> Two Column Paper  
\documentclass{beamer} --> Presentation
```

2. Add in all the packages you need in the preamble. Some of the standard packages I use in economics problem sets and papers are:

```

\usepackage[latin1]{inputenc}
\usepackage{amsmath} %--> math
%For Langrian L --> the %is used to comment out information and is never seen in th
\usepackage{mathrsfs}
\usepackage{amsfonts}
\usepackage{amssymb} %-->Math
\usepackage{graphicx} %--> Adding images, tables and graphs
\usepackage{setspace}
\usepackage{epstopdf}
\usepackage[margin=1.5cm]{geometry}
\usepackage{cancel}
\usepackage{hyperref}
\usepackage{fullpage}
\usepackage{color}
\usepackage{threeparttable}
\usepackage{float}
\newcommand{\highlight}[1]{\colorbox{yellow}{31}}
\renewcommand{\baselinestretch}{1}

```

3. Add a title or title page

Simple Title

```

\title{Introduction to LaTeX}
\author{Carycruz Bueno }
\date{June 20, 2016}

```

Title Page

LaTeX code for a title page:

```

\begin{titlepage}

\newcommand{\HRule}{\rule{\linewidth}{0.5mm}} % Defines a new command for the horizonal rule

\center % Center everything on the page

\textsc{\LARGE Georgia State University}\\[1cm] % Name of your university/college
\textsc{\Large Andrew Young School of Policy Studies}\\[1cm] % Major heading such as department
\textsc{\Large Economics Department}\\[3cm] % Major heading such as course name

\HRule \[0.4cm]
{ \huge \bfseries Advanced Labor II: Problem Set 2}\\[0.4cm] % Title of your document
\HRule \[3cm]

```

```

\begin{minipage}{0.4\textwidth}
\begin{flushleft} \large
\emph{Author:}\
\textbf {Carycruz Bueno\\Jarod Apperson} % Your name
\end{flushleft}
\end{minipage}
~

```

```

\begin{minipage}{0.4\textwidth}
\begin{flushright} \large
\emph{Professor:} \
\textbf{Dr. Daniel Kreisman } % Supervisor's Name
\end{flushright}
\end{minipage}\[3cm]

```

```

{\large \ April 14 2016}\[3cm] % Date, change the \today to a set date if you want

```

```

%\includegraphics{Logo}\[1cm] % Include a department/university logo - this will r

```

```

\vfill % Fill the rest of the page with whitespace
\end{titlepage}

```

```

\newpage % Begins the essay on a new page

```

4. Declare that you are beginning your document. Note that I also have end document command.

```

\begin{document}\
\maketitle --> adds the title (if using the simple version)
\begin{titlepage} --> use if you want a full title page
% content from above of what you want on your title page
\end{titlepage}
% Document content\
\end{document}

```

5. One can add sections and subsections to a file with the command

```

\section{Introduction}
\subsection{Why Use Latex?}
\section{Set Up}
\section{Data}
\subsection{Data 1}
\subsection{Data 2}

```

6. Every Environment needs a beginning and an end. For example:

```
\begin{equation}
Y = 2x+5
\end{equation}
```

7. Useful commands

1. Enumerate:

```
\begin{enumerate}
\item It produces beautiful end products that includes multiple mediums (words,
\item Allows more systematic formatting
\item Its the standard in the economics profession
\end{enumerate}
```

Output:

- (a) It produces beautiful end products that includes multiple mediums (words, equations, graphs)
- (b) Allows more systematic formatting
- (c) Its the standard in the economics profession

2. Equation (with and without*)

```
\begin{equation}\label{eq:1}
Y = 2x^{2}+5
\end{equation}
\begin{equation*}
Y = 2x^{2}+5
\end{equation*}
```

Output:

$$Y = 2x^2 + 5 \tag{1}$$
$$Y = 2x^2 + 5$$

3. Align

```
\begin{align*}
q(z) &= \ln(z+1) \quad \backslash\backslash
q'(z) &= \frac{1}{z+1}
\end{align*}
```

Output:

$$q(z) = \ln(z + 1)$$
$$q'(z) = \frac{1}{z + 1}$$

8. Graphics, Tables, Images and references

You can create your own table:

```
\begin{table}[H]
\caption{Mean Correlation} % title of Table
\label{tab:1}
\centering % used for centering table
\begin{tabular}{c c c } % centered columns (4 columns)
\hline\hline %inserts double horizontal lines
Variable & Mean Corr w/Output
\\ [0.5ex]
\hline
Consumption & 0.9838 \quad \backslash\backslash
Investment & 0.8961 \quad \backslash\backslash
Capital & 0.5966 \quad \backslash\backslash
Labor & 0.8180 \quad \backslash\backslash
[1ex] % [1ex] adds vertical space

\hline %inserts single line
\end{tabular}
\end{table}
```

Output:

| Table 1: Mean Correlation | |
|---------------------------|--------------------|
| <i>Variable</i> | Mean Corr w/Output |
| Consumption | 0.9838 |
| Investment | 0.8961 |
| Capital | 0.5966 |
| Labor | 0.8180 |

Or you could import a table saved from Stata but you need to make sure that the table is saved in the same folder.

See Table 2 below.

```
\input{summarystats}
\label{table:2}
```

Output:

Table 2: Summary Statistics

| Variable | Mean | Std. Dev. | Min. | Max. | N |
|-----------------|--------|-----------|--------|--------|------|
| Black | 0.246 | 0.431 | 0 | 1 | 4652 |
| Hispanic | 0.196 | 0.397 | 0 | 1 | 4652 |
| Age | 28.949 | 1.394 | 27 | 31 | 4652 |
| AFQT | 0.001 | 1 | -1.618 | 1.811 | 4652 |
| AFQT Squared | 0.999 | 0.883 | 0 | 3.279 | 4652 |
| Highest Grade | 14.095 | 2.904 | 6 | 20 | 4603 |
| Hourly Wage | 17.891 | 9.779 | 1.06 | 76.125 | 4652 |
| Log Hourly Wage | 2.758 | 0.499 | 0.058 | 4.332 | 4652 |

```
\underline{References}
```

As shown in Table \ref{tab:1} consumption has the highest correlation with output.

Output:

References

As shown in Table 1 consumption has the highest correlation with output. Or maybe you would like to reference equation 1 for more practice.

9. Math, Symbols, Greek Letters

Refer to the document “Quick Guide to L^AT_EX” by Dave Richeson which has the most common used letters, symbols, and notation.

One distinction worth making is writing math equations within a line. For example

```

$$\frac{w}{c} = \frac{\eta}{(1-n)^2}$$
 or using the equation environment:
\begin{equation*}
\frac{w}{c} = \frac{\eta}{(1-n^2)}
\end{equation*}
```

Output: One distinction worth making is writing math equations within a line. For example $\frac{w}{c} = \frac{\eta}{(1-n^2)}$ or using the equation environment:

$$\frac{w}{c} = \frac{\eta}{(1-n^2)}$$

Note that the symbol \$ was used on both sides of the math equation when writing an equation within a line or amongst text.

Also if you can not find how to do something in your document. You can always google it. For example: Who do you do a sub script in latex? and you will find that you have to use the underscore.

One example is `$f_l = 2xy^{3}$`

Output:

One example is $f_l = 2xy^3$

Your Assignment:

Now its your turn!! Before leaving today I want you to replicate a short problem set that I have given you in the pdf version. Once you have completed it please show me and once approved you are welcome to leave.