Computational Bootcamp 5: LaTeX, Markdown, and Formatting Documents for Social Science

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Installation: LaTeX

- Installing LaTeX can take a long time
- You do not need to install LaTeX to use Overleaf (although you will need to make an account on www.overleaf.com)
- My preferred way to install LaTeX, if you want it primarily for RMarkdown, is to install it through R (TinyTex package)

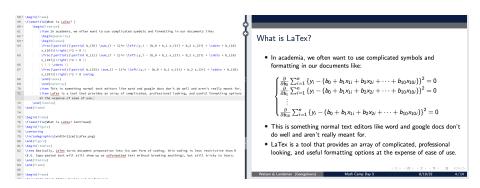
What is LaTex?

 In academia, we often want to use complicated symbols and formatting in our documents like:

$$\begin{cases} \frac{\partial}{\partial b_0} \sum_{i=1}^n \left\{ y_i - \left(b_0 + b_1 x_{1i} + b_2 x_{2i} + \dots + b_{10} x_{10i} \right) \right\}^2 = 0 \\ \frac{\partial}{\partial b_1} \sum_{i=1}^n \left\{ y_i - \left(b_0 + b_1 x_{1i} + b_2 x_{2i} + \dots + b_{10} x_{10i} \right) \right\}^2 = 0 \\ \vdots \\ \frac{\partial}{\partial b_{10}} \sum_{i=1}^n \left\{ y_i - \left(b_0 + b_1 x_{1i} + b_2 x_{2i} + \dots + b_{10} x_{10i} \right) \right\}^2 = 0 \end{cases}$$

- This is something normal text editors like word and google docs don't do well and aren't really meant for.
- LaTex is a tool that provides an array of complicated, professional looking, and useful formatting options at the expense of ease of use.

What is LaTex? Continued

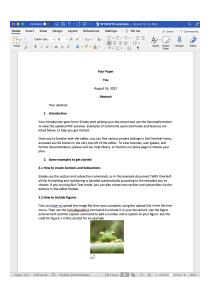


 Basically, LaTex turns document preparation into its own form of coding, this coding is less restrictive than R (E.G. Copy-pasted text will still show up as unformatted text without breaking anything), but still tricky to learn.

Text Editor Design and Usefulness

- In general, there are two paradigms of text editing, WYSIWYG (what you see is what you get, often referred to as wizywig), and WYSIWYM (what you see if what you mean, often referred to as wizywim).
- In WYSIWYG editors, like Word, Google Docs, and PowerPoint, you write and format content at the same time.
- In WYSIWYM editors, formatting is done in a separate step (compiling, knitting, etc) with the aid of style commands and a stylesheet.

WYSIWYG



WYSIWYM



42 Note that your figure will automatically be placed in the most appropriate place for it, given the surrounding text and taking into account other figures or tables that may be close by. You can find out more about adding

\href(https://www.overleaf.com/learn/how-to/Including_images_on_Overleaf)(including images on Overleaf).

Your Paper You August 16, 2022

Abstract

Your abstract.

1 Introduction

Your introduction goes here! Simply start writing your document and use the Recompile button to view the updated PDF preview. Examples of commonly used commands and features are listed below, to help you get started.

to seep you get started.

Once you're familiar with the editor, you can find various project settings in the Overloaf menu, accessed via the button in the very top left of the editor. To view tutorials, user guides, and further documentation, please visit our help library, or head to our plans page to choose your plans.

2 Some examples to get started

2.1 How to create Sections and Subsections

Simply use the section and subsection commands, as in this example document! With Overload, all the formatting and numbering is handled automatically according to the template you've closes, all if you're using Rich Text mode, you can also create new section and subsections via the buttons in the editor tooling.

2.2 How to include Figures

First you have to upload the image file from your computer using the upload link in the file-tree menu. Then use the includegraphics command to include it in your document. Use the figure environment and the caption command to add a number and a caption to your figure. See the code for Figure 1 in this section for an example.

Note that your figure will automatically be placed in the most appropriate place for it, given the surrounding text and taking into account other figures or tables that may be close by. You can find out more about adding images to over decuments in this help article on including images on Overleaf.



Figure 1: This from was unloaded via the file-tree menu

images to your documents in this help article on

for an example.

Quick Aside, Sending Word Files

- Whether you choose to use LaTex, Markdown, or neither, the goal should be to send .pdf files for final documents unless you are strictly required to send a word document.
- This is important for two reasons:
 - .doc/.docx/Google Docs type files save meta-data (E.G: edit history) that can be embarassing.
 - PDFs, particularly PDFs generated by Markdown and Latex, but also PDFs exported by Word, have a cleaner more professional look that will improve your confidence in submission and signal to whoever is reading your work that you know what you're doing.
- Share document files when you are collaborating with someone, share pdfs when they are evaluating your work. Where the line between the two is unclear, ask.

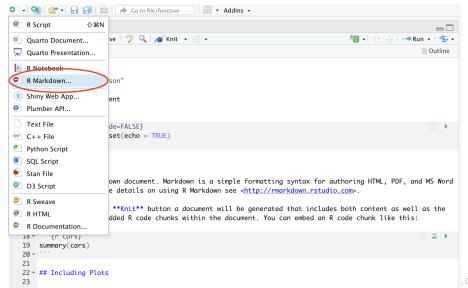
Markdown and RMarkdown

- Markdown trades some of LaTex's range of use for significant improvements in ease of use.
- RMarkdown combines Markdown with an r script editor that is almost as clear as the normal R script editor.

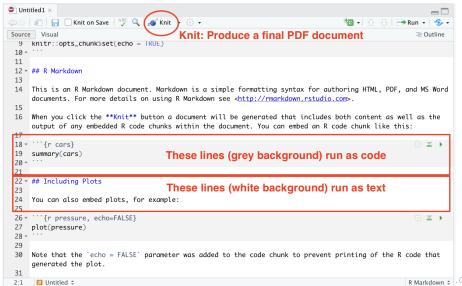
Installation: LaTeX (for R Markdown

```
install.packages("rmarkdown")
library(rmarkdown)
install.packages("tinytex")
tinytex::install_tinytex()
```

RMarkdown



RMarkdown



For anyone who uses Pages

For a 3x3 matrix
$$A = \begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$$

- Multiply a by the determinant of the 2x2 matrix that is not in a's row or column
- Likewise for b and for c

$$|A| = a \begin{vmatrix} e & f \\ h & i \end{vmatrix} - b \begin{vmatrix} d & f \\ g & i \end{vmatrix} + c \begin{vmatrix} d & e \\ g & h \end{vmatrix}$$

the determi

d order are

there are reder and ran other wordight fail the nverse/inve

Edit Equation

|A| = a
\begin{vmatrix}
e & f \\
h & i \\
end{vmatrix}
-b
\begin{vmatrix}
d & f \\
end{vmatrix}
+c
\begin{vmatrix}
d & e \\
end{vmatrix}
d & e \\
g & h \\
end{vmatrix}

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Problem Sets for GOVT 701

- Because RMarkdown allows you to include code in your writeup, with ""{r include = TRUE} it is great for projects where we are evaluating your coding skills like 701 problem sets.
- For those of you who are going on to 701 with some coding background. Writing problem sets in RMarkdown is a great way to make the class a little more challenging while preparing yourself for academic paper writing.
- Don't kill yourself trying to do this if you aren't there! Submitting a word document and r script for problem sets is also fine.