Introduction to Statistical Computing in Political Sciennce

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Chapter 1

Welcome

If you have any questions about the materials, please contact me at mshieh2@wisc.edu.

Chapter 2

Introduction

This is a one-credit, pass/fail course for first-year PhD students at the Department of Political Science at the University of Wisconsin-Madison. Students will learn how to organize their projects using Git, connect to Github, become R-literate, use R to conduct statistical analyses and create graphics, write their documents in an R Markdown file, create a replicable R Project, and use other computings tools that may help them on their academic journey. Due to COVID-19, the course will be taught virtually during the Fall 2020 semester and recordings of the lectures will be available on Canvas to enrolled students.

The first hour of the course covers everything that students need to know to complete all assignments in the class. The second hour walks through the weekly assignments and provides additional support. To balance out the effects of the virtual environment, I will try to make the class as connected as possible. In addition to regular office hours, we will have a Slack for class questions and discussion. The hope is that each student will be able to get their questions answered as soon ass possible.

You may access the latest draft of the syllabus here.

Chapter 3

Setting Up

In this lecture, you will learn how to knit a document in R Markdown and use basic Git functions.

1. Install R.
2. Install R Studio.
3. Install LaTeX.
4. Knit a document in R Markdown in PDF and HTML.
5. Create a Github account.
6. Set up Git.
7. Connect RStudio to your Github account.
8. Work with Git on RStudio.

3.1 Installing R

R is a statistical programming language that is widely used in the discipline. Go to the R official website to learn more about the software.

These instructions will help you download R on to your operating system.

1. Go to list of CRAN mirrors. A "mirror" is essentially a distribution site for the software.

2. Select your preferred CRAN mirror. I recommend that you select the mirror closest to your current location. For example, if you are in Madison, WI, you should consider picking the mirror located at University of Michigan, though any of the midwestern universities will do.

3. Select the download for your operating system.

3.2 Installing RStudio

RStudio is an integrated environment for R. If R is the engine, RStudio is the car. You can use the engine without the car, but you cannot drive the the car without the engine. In other words, you will not be able to use RStudio if you have not yet downloaded R. Always download R first. Go to the RStudio official website to learn more about the software.

These instructions will help you download RStudio on to your operating system.

1. Go to the Download RStudio page.
2. Click on the "Download" button" for RStudio Desktop Open Source Licnse Free.
3. Click on the "Download RStudio for [your OS]" button. The website should be detect which version of RStudio that you need to download.

3.3 Installing LaTeX

LaTeX is a software system for document prepartion. While we will not focus on LaTeX functionalities in this class, you will need to download it to compile R Markdown documents. Go to the LaTeX official website to learn more about the software.

If, for any reason, you would like to learn LaTeX, I would recommend opening an Overleaf account and leveraging their step-by-step tutorial. While this course will primarily focus on teaching you how to write and generate your documents in R Markdown, you may encounter collaborators who use LaTeX. The good news is that R Markdown is pretty similar to LaTeX, so the skills are definitely transferrable.

These instructions will help you download LaTeX on to your operating system.

1. Scroll to the third section of the Get page where you see download options for Linux, MacOS, Windows, and Online.
2. Select your operating system.
    - For MacOS users, you should download MacTeX. You may access step-by-step instructions here.
    - For Windows users, the website suggests that you download MikTeX, proTeXt, or TeX Live. There is a StackExchange post discussing these options and then some. It appears like most people recommend TeX Live.