Lab 0: Getting Started with RStudio and RMarkdown

## Goals

We aim for our students to

1. feel that lab is an environment that is welcoming and supportive of their success in the class.
2. start the process of meeting their class mates and setting the norm of a collaborative culture.
3. learn to ask and answers questions of staff and fellow students between classes.
4. be able to locate, work on, and turn in assignments.
5. understand course structure and expectations.

## Approximate Timing

* Icebreaker + Introduction (10 min)
* Intro to Ed (5 min)
* Lab 0 Demo (10 min)
* Lab 0 Students (20 min)
* Q & A (5 min)

## During Berkeley time

* Write out the 7 steps of Lab 0 (below) on the side board, plug your laptop into the projector, and click AV mute to turn off the screen until you’re ready
* Introduce yourself to students as they enter
* Ask students to sign-in (this is informal)

## Part 1: Pre-lab

### Icebreaker

* Gives students 1 min to write down 2 truths and 1 lie in the meantime, write students names on the boards in groups of five. The sign-in sheet is helpful here.
* Ask students to get into their groups of 5 and take turns sharing:
  + name
  + hometown
  + 2 truths and lie
* After each student shares, group discusses which statement is the lie, then the next student shares

### Introduction and lab overview

* Introduce yourself, your background, what you’re looking forward to in teaching Stat 20, etc.
* Explain lab:
  + Who: 25 students + GSI
  + What: Students will be applying the concepts discussed in lecture, often by doing a data analysis, other times an activity or solving problems
  + When: Tu, Th mornings for 50 minutes
  + Where: In-person, though we have the capacity for meeting remotely if COVID or fires require it
  + Why: Doing statistics requires a synthesis of conceptual frameworks, ideas and notation from mathematics, computation tools, and an understanding of the context of the data. It’s a complex task and it requires practice.
  + How: When doing data analysis, for our computational tool we’ll be using R.

### Introduction to Ed

Turn on the projector (students can keep their laptops closed still) and go to the discussion forum and demonstrate a few things:

1. How to ask a question: The default should be that messages are public - other students likely have the same question and will benefit from hearing the answer.
2. How to answer a question: You’re encouraging to chime in, hearting questions/posts you appreciate, and try to answer the question. Always be kind.
3. How to send a message to the instructor / GSIs: mark the question as private.

The evening before this lab, students that are enrolled and on the waitlist will get an email inviting them to join the class discussion forum at edstem.org.

Create a new post called, “Things that are not true about Lab XX”, then ask that the students open their laptops and reply with their lie from the icebreaker. You can demonstrate how to heart, and reply to replies.

## Part II: Lab 1

### You demonstrate

The goal of this first (very short) lab is to get students used to the workflow of the weekly problem set and lab, both of which will be done in Rmds in RStudio and turned in via GradeScope. More specifically, they should be able to:

1. Log into Rstudio
2. Create a new markdown document and save it
3. Modify the document, adding markdown and R code, while knitting
4. Re-knit to pdf and inspect
5. Download pdf
6. Upload pdf to gradescope
7. Sync the repository with the course materials

Draw the diagram below on the whiteboard:

A few things to note:

1. They should be able to connect to rstudio from anywhere.
2. They can use it for more things besides this class, so to keep things organized: keep all of your work for this class in stat20-fall21.
3. Because rstudio will be in the cloud, anytime they want to get files from their computer into rstudio or vice versa, they’ll need to upload and download them.

Next, you’ll be demonstrating steps 1 - 2 while they watch. Please ask them to wait to follow along until you’ve gone through both. Pull down the screen, turn off the AV mute, bring up a browser, and click on the link posted on Ed that brings them to datahub and syncs it with the course repository. You can tell them to ignore the files there for now - they won’t need the instructions since you’ll be going through those on the board.

Click the green plus in the upper left corner to create a new file > R Markdown. Switch to pdf output and change the title to “Lab 1 Getting Started”. After the file is created, then click the save button, and title it “01-getting-started”. Save it in the labs folder to keep things tidy. Check the file tab to be sure it’s in the right place (students will often get this wrong and not keep good track of files). Knit the pdf, then carefully go through each component of the Rmd and show what it turned into in the pdf - the header, the markdown text, the title/subtitle, r code, the plot. No need to get into too much detail about the structure of Rmd files now; we’ll open Tuesday’s lab with a more explicit discussion of that.

At this point, ask that the students open up their laptops and go through those steps 1 - 2. Walk around and be sure that everyone gets to the stage of looking at a pdf before you continue. Once they’re all set, write up the following 5 things on the board for them to do (you may want to abbreviate these things when writing).

1. Add author: Your Name on a new line within the header.
2. Delete everything after the header.
3. Add a new title ## My Home County: {homecounty, state}. If you’re from abroad, instead use ## Where I'd like to visit: {county, state}.
4. Copy and paste the first few paragraphs from that county’s Wikipedia page (the bit before the “Contents” section) into the Rmd and remove any weird formatting.
5. Use the button at the top of the Rmd to insert a chunk and then copy the following code into it. Modify the "CA" to be the two letter abbreviation of your state and modify "Alameda" to be the name of your county. Leave the rest unchanged.

library(tigris)  
library(tidyverse)  
  
counties("CA") %>%  
 filter(NAME == "Alameda") %>%  
 ggplot() +  
 geom\_sf()

Walk around and help, encouraging them to knit after every step to see how things change. Once everyone is onboard, have them download their pdf file, then upload it to gradescope.