Day 1: Introduction to Math Camp

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Math Camp 2022

Background

- Course covers needed background for statistics courses in PS and Soc
- Begin with math background
- Cover probability and basic statistics
- (re) visit calculus (WOOHOO!)

Background: How this Course Builds

- Every day builds on previous
- Jumping to integrals would be hard and complicated – so unpack one concept a day at a time
- Each day can matter because it's a Thing You Need To Know (e.g. algebra) or because it will lesson the pain later (e.g. function composition).
- Everyone comes with a different level of experience and background–learning is a journey

Goals

When this course ends, we'll have accomplished the following:

- Introduce and/or refresh math foundation for fall class
- Familiarity with software options and programs for the fall
- Understanding of expectations for fall course, familiarity with TAs and Professor
- Accomplishment of introductory aspects of course (can load programs, calculate integral, etc)
- Hit three levels of depth, depending on concept: can recognize, somewhat familiar, comfortable

Expectations

For this course and the fall classes:

- Come to every session
- Review the slides
- Check out the book
- Ask questions
- Try practice problems
- Complete the assignments
- This class is a big commitment: it will feel as long for you as it does for us!

Additional Learning Goals Built Into Math Camp

This week we will also take a deep dive into some computational tools that are necessary or useful to perform modern, quantitative political scienctific analysis. Regardless of whether you intend to pursue academia or not, these skills will be transferrable to various careers. We recommend that you do a bit of research tonight to begin to acquaint yourself with each of the following programs or platforms:

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- R and RStudio
- Github
- LaTeX and Overleaf

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Other programming platforms that you might want to acquaint yourself with, but won't be covered here are Python (via Anaconda and Jupyter Notebooks) and STATA.

The debate regarding R versus STATA is long and drawn out throughout various disciplines, for our purposes R is open source (i.e. FREE) and thus much more accessible for long-term use.

Miscellaneous

- Start on time
- Assignments due 48 hours after assigned day – do your best and feel free to work together as long as you submit YOUR OWN work.
- Class not graded, answer keys posted
- Foundation for methods classes – maybe some new content, maybe less so

Impetus: Why are we all here?

- Do voter ID laws affect turnout?
- Is there a wage gap between genders?
- Would enshrining more rights in a constitution lead to a more stable document than a more vague/ambiguous specification?

Impetus: Why are we all here?

- Literacy in quantitative methods
- Develop skills to excel in quantitative coursework
- Build relationships with cohort – study groups, etc

How do I GRAD STUDENT?

- DO THE READING (this might sound crazy, but this is really the most free you'll be in the foreseeable future)
- BUILD COMMUNITY (these are the people you'll be excited to see at conferences, coauthor with, talk ideas over, etc)
- BE TRUE TO YOURSELF (work to develop your research interests, be well rounded, but try to aim toward your final goal)
- BE KIND TO YOURSELF (grad school will take forever and be frustrating at times; well-meaning relatives will ask when you're going to 'get a real job')
- GET A HOBBY (something orthogonal to your grad school progress – fitness, cooking, reading, numismatics, theater, etc)

COVID Plan

- Don't come to class if you don't feel well
- We will all need to be flexible, adaptable, and kind this term
- Masks indoors per CDC
- I have young kids in school (can't get vaccine yet), so I will need to be particularly flexible/adaptable.

Assessment

~20 mins, answer what you can

Math (P)refresher: Review Topics

- Broad Overview
- Sets
- Algebra review
- Inequalities
- Combinatorics
- Summation
- Derivatives
- Integrals

Introductions

Let's get to know each other a bit more – Name, pronouns, subfield/research area, where you are currently, something fun/interesting about you and/or your hobbies