Assignment 2: Maps, Descriptive Statistics, and Probability

Insert Name Here PSC 8101, Assignment 2
Due Friday, Sept. 26, 2025

Instructions

Answer the questions within this document. Make sure to answer the questions in sufficient detail. Keep the questions included below in your final document. Because the "format" in this document's YAML header is set to "pdf," the document you render and turn in will be a .pdf.

- **Workflow alert**: Before working with your .qmd file (Quarto), put all of your graphing commands in the "Assignment 2.R" script file. Use your script file to make sure all your graphs execute correctly first. Then you can copy and paste those commands over to your .qmd file and include your interpretations.

- **In your rendered document (pdf),** include your output/graphs and your explanations (in addition to the questions asked). Unlike for Assignment 1, *do not include your R code in this assignment.* Also, do not include any R warnings or errors in the output. All of this is already specified in the YAML code (i.e., echo: false; warning: false; error: false).

- For all maps, *make sure to use descriptive labels instead of raw variable names and/or numerical values.* Provide descriptive titles for your graphs, too.

- Submit your rendered .pdf in Blackboard.

1. Descriptive Representation in the U.S. Congress

A key question in political representation research around the world concerns the extent to which legislatures are representative of the people. In the U.S., does Congress "look like" America when it comes to racial and gender diversity? This is called "descriptive representation." The U.S. House of Representatives, often called the "People's House," is a good candidate for investigating this question. Some state legislatures draw "majority-minority" congressional districts, which are districts whose majority population consists of a minority group (e.g., black or Hispanic). Thus, another key question in American politics is how effective such districts are in increasing racial diversity in Congress and enhancing descriptive representation.

In this problem, you'll examine how representative the 117th (2021-2023) U.S. House of Representatives was. (Data for the new Congress (118th) are not fully updated at this time.)

You'll use the "house.dta" data (435 congressional districts, N=435) to analyze the following variables:

- **race**: The race of each congressional district's elected representative. For this assignment, you'll focus on the value "Black" as used by Congressional Quarterly's data collection.
- **pct_black**: Percent of the population in the congressional district that is black (as

categorized by the Census Bureau via the American Community Survey). Note that these are actually *proportions*, but using "labels=percent" from the scales package will convert them to percentages in your map (in the legend).

Use the tigris package and the house data to generate two choropleth national maps at the congressional district level:

- A map showing variation in the percent of the population that is black across congressional districts. Note: Use "labels=percent" (via the scales package) to turn the proportions into percentages (particularly in the legend). Include state lines in your map, too.

- A map indicating whether or not each congressional district is represented by a black member of Congress. Note: You'll need to do some data wrangling to create a new variable, based on "race," to indicate whether a representative is black (=1) or not (=0). Include state lines in your map, too.

A. Is the U.S. House representative of the black population? Interpret maps 1 and 2 to draw a conclusion about this question.

B. How effective are majority-minority districts at enhancing descriptive representation in the House?

2. Judicial Independence in Global Context: Is the U.S. Supreme Court Unique?

Politicians around the world often politicize high courts for partisan political gain. People tend to think of the U.S. Supreme Court as immunue to such politicization, but with politicians increasing their attacks on the U.S. Supreme Court's independence, it's worth asking: *Is our Supreme Court unique in global context compared to other high courts around the world?*

You'll analyze this question by merging data from the "Varieties of Democracy" (V-Dem) dataset ("vdem.dta") from the year 2021 (N=179 countries) with a world map object using the "rnaturalearth" package. You'll work with two variables from V-Dem:

- **v2juhcind_ord**: This is a measure of each country's level of **judicial independence** based on country expert assessments. Specifically, the measure seeks to tap autonomy from versus subservience to those in political power. The scale has five categories, where higher values indicate greater judicial independence: 4=extremely high independence, 3=quite high independence, 2=moderate level of independence, 1=quite low level of independence, 0=extremely low independence.

- **v2jupoatck_ord**: This is a measures of the frequency of **government/politician attacks** on high court integrity in the country. The measure seeks to tap the frequency with which government and politicians claim that the high court is "corrupt,

incompetent or that its decisions are politically motivated." 0=daily/weekly, 1=every month, 2=more than once (per year), 3=rare, 4=none.

A. Generate two choropleth world maps: One for judicial independence and one for attacks. Treat each variable as a factor variable so that you can label the legend categories as discrete. Examining the maps separately and in conjunction with other (are there associations?), interpret what you visualize. How unique is the U.S. Supreme Court in global context?

3. Exercises from *OpenIntro*

A. 1.42, p. 38, "Screens, teens, and psychological well-being."

Enter answer here

B. 2.16, p. 59, "Distributions and appropriate statistics, Part II." Answer (b) and (c) only.

Enter answer here

C. 2.22, p. 69, "Views on immigration."

Enter answer here

D. 3.10, p. 93, "Guessing on an exam."

Enter answer here

E. 3.12, p. 94, "School absences."

Enter answer here.