**HOMEWORK 2: SHINY PORTFOLIO PROJECT**

This homework asks for a Shiny visualization and an associated write-up.

**Instructions**

For your write-up, please upload **a well-formatted PDF, Word, other text document.** 750 words maximum. Do not include your write-up in your R code file!

For your Shiny app, please submit two things:

* **Your .Rmd or .R file(s).**
* **Evidence of your Shiny app’s functionality**. For this requirement, you should submit one of the following things: a series of screenshots of your app working, a screen recording of your app working, or a public link to your app on [shinyapps.io](https://www.shinyapps.io/).

You do **not need to submit any data files**.

**Description**

The portfolio exercises are opportunities for you to design and share visualization without the constraints of in-class exercises. In this portfolio assignment, we will use shiny to create an interactive visualization and prepare a brief discussion on a topic that is interesting to you. For datasets, you may find it useful to browse TidyTuesdays, Data is Plural, Kaggle Datasets,

Google Dataset Search, AWS Data Registry, Wisconsin DNR, IPUMS Census Data, 538, Data.gov, Madison Open Data, Bioconductor Datasets, Awesome Public Data.

Once you have identified a dataset, you will use the shiny package to create a publication-quality interactive visualization. The application should implement at least two types of dynamic queries, either through UI or graphical inputs. The application should be annotated with text to provide context, so that the application is understandable to users who are not necessarily familiar with the dataset. If the interface’s inputs are not immediately intuitive, instructions should be given. Code implementing this application should be modular, with reactive expressions used to minimize duplication and functions defined to externalize complex logic.

Write-ups should be aimed at someone with **no knowledge or interest in coding** (e.g. do not mention specific functions), but who is interested in understanding your visualization and how you developed it. Please address the following prompts:

* Provide a short description of the dataset, including:
  + Where you found it (Include a link and the author’s/organization’s name)
  + A high-level mention of any important transformations you made to the dataset before visualizing
  + What a single row of the (potentially transformed) dataset represents in real terms
  + Any relevant criteria for being included/excluded from this dataset (e.g. does it cover certain years, certain cities, etc?)
  + A brief explanation of any variables relevant to understanding the visualization; including units and brief background information where necessary. You do not need to cite specific variable names.
* The bulk of your write-up should answer these prompts about the design process:
  + What is the main question your app investigates, and who is its intended audience?
  + Why did you choose the specific interactive elements you did?
  + What guided the style customizations and interface layout you used?
  + Provide at least one example of how using an interactive element in your app enables a specific, unexpected finding in the data.

**Rubric**

**Shiny App [12 points]**

Design Choices [8 points]: The visual interface should support meaningful interactive queries and be appropriately annotated. Your design choices should go above and beyond defaults, and show critical thinking as well as attention to detail towards aiding the viewer in understanding the takeaway(s) of the visualization. Strive to make your graphs as polished as possible; especially with choices such as layout, labels, sizes, themes, and colors. Though it may build from course examples, the submission demonstrates independent and creative thinking.

Code Useability [2 points]: Techniques to improve the conciseness and readability of code are used, such as using reactive expressions to avoid unnecessary duplication, and extracting graphing or other helper functions outside of render\* commands.

Problem Formulation [2 points]: The context of the visualization is appropriately communicated, and all data are reported within context, rather than assuming prior familiarity with specific variable names or data collection methods, for example. (*You can still use field-specific terminology if your intended audience would know what it means, but any such terms should be explained in your write-up.*) The problem or question the visualization investigates should not have an obvious answer, and the visualization could have an audience beyond the course.

**Write-up [8 points]**

Discussion Quality [6 points]: The write-up is thorough with respect to each prompt but not overly wordy and avoids technical jargon. Writing demonstrates critical thinking about the author’s own workflows, decisions, and what information needs to be communicated to the viewer.

Discussion Formatting [2 points]: The write-up is free of grammatical errors and logically organizes the text into clear sections (e.g., with headers or other formatting devices).