Assignment Description

Objective: Work with and in RStudio and Quarto documents to learn about markdown.

Requirements: Come up with a question answerable by data. Collect that data and then summarize your observations using numerical and graphical approaches and then discuss what you found.

There are two parts to this assignment: Quarto and Markdown elements and then the actual data collection, summarization, and discussion.

Markdown Elements

- italicized phrase
- bold phrase
- image
- R plot
- a table (markdown most likely, but there are other ways to do this if you would like!)
- an ordered list (1., 2., …)
- an unordered list (e.g., bullet list)
- appropriate use of headings, sub-headings, and sub-sub-headings as required

Please remember to also submit proof that you have completed the Trent Academic Integrity module on Blackboard.

Marks:

- Markdown Elements: [**8 marks**] (1 for each element)
- Data collection and discussion: [**11 marks**]
- Formatting and Style: [**2 marks**]
  - use of headings, code not running off the page, plot titles and labels, etc..

Submission:

- Crowdmark: rendered PDF file
- Blackboard: `.qmd` file, PDF file, and `.csv` file

Late Penalty: 2% per day late, up to 5 days. After 5 days, no marks will be provided. *Note: that 2% of this assignment is worth 0.06% of your final grade.*

Instructions

1. **[1 mark]** Introduce a question that you could collect data to answer
   - we collected data in our first lecture: coin flips, dice rolls, decks of cards where questions could be
     - "is this coin fair"
     - "what is the probability of rolling four 7's in a row on two dice?"
   - please don't use coin flips or dice rolls for this assignment and your questions can be more interesting if you'd like as well!
2. **[2 marks]** Collect data related to your question and record this in a spreadsheet.
   - describe the collection method
   - include one (1) image related to your data collection or data
     - this satisfies the Markdown element requirement!
3. **[1 mark]** Read this data into R (we will discuss this during our class on January 19)
   - save the file as a `.csv` (comma separated values) file
   - use the function `read.csv` to read the file into R
   - make sure that your `.qmd` file and `.csv` file **are in the same directory**.
4. **[2 marks]** Use numerical summaries to describe your data. Definitely include the number of observations you collected and in addition, these could include, but are not limited to:
   - Discrete data
     - counts of observations in each category
     - proportions of observations in each category
     - other methods if you know of them
   - Continuous data
     - mean, median, IQR, standard deviation, min, max, and more?
   - Use a *nice*, publication quality (or close), table for this (i.e., do not present a table that is only R output please!)
5. **[3 marks]** Use one or more graphical methods to help visualize your data. Including, but not limited to:
   - Discrete data
     - barplots (counts and proportions)
     - other ways you can think of?
   - Continuous data
     - histogram, boxplot, scatterplot, and more!
   - Ensure titles and axis labels. It should be reasonably clear what the plot is about without needing to even read your document.

6. **[2 marks]** Discuss your data, numeric and graphical summaries. Think about the following questions in your discussion:

   - do you have an answer to your original question?
   - what issues came up during this process?
   - if you knew how or had the resources, what would you do differently?
   - anything else of interest?