2.a. Exploring Univariate Data Visualization

Objective:
          To learn how to visualize univariate data using different types of plots.

Dataset Description: 'mtcars' dataset with 32 observations on 11 (numeric) variables.

[, 1]   mpg   Miles/(US) gallon
[, 2]   cyl   Number of cylinders
[, 3]   disp   Displacement (cu.in.)
[, 4]   hp   Gross horsepower
[, 5]   drat   Rear axle ratio
[, 6]   wt   Weight (1000 lbs)
[, 7]   qsec 1/4 mile time
[, 8]   vs   Engine (0 = V-shaped, 1 = straight)
[, 9]   am   Transmission (0 = automatic, 1 = manual)
[,10]   gear   Number of forward gears
[,11]   carb   Number of carburetors

Visualization Questions

1. What is the distribution of the mpg variable in the mtcars dataset?
2. What are the counts of cars for each cylinder type (cyl)?
3. What is the proportion of cars with automatic (am = 0) versus manual (am = 1) transmission ?
4. How does the distribution of hp (horsepower) look? Create a boxplot to identify any potential outliers.
5. What is the frequency distribution of cars with different numbers of gears (gear)?

Bonus:

1. Add 2 to 3 visualization questions of your choice and plot.

2.b. Visualize Datasaurus dozen

Objective:
          To visualize the Datasaurus dozen dataset for understanding the challenges in summary statistics.

Link to download the dataset:

https://drive.google.com/file/d/1Cr9Z9I17Npm19c2Nq34lhb15sQpodxPB/view?usp=sharing

Submission Guidelines:

- You can choose the programming language that best suits your approach and skills.
- Please avoid using commercial software (e.g., MATLAB, Tableau) for your visualizations. We encourage the use of open-source tools like Python, R, or JavaScript libraries
- If you are working in python, submit the assignment as a .ipynb (Jupyter Notebook) file. Include a .pdf export of the notebook if required for easier review
- For other languages, Export all the codes, comments and results into a PDF file and submit it
- Name your file as DS304_LabAssignmentX_StudentID.ipynb (where X is the lab number).
- Include comments in your code to explain your logic and approach.
- Use Markdown cells for detailed explanations, if necessary, especially for complex code blocks.
- Ensure that all code cells have been executed and the outputs are visible.
- Do not clear the outputs before submission.
- Submit the assignment via the designated Google Classroom link.
- Submit your work before the end of the day.
- Late submissions may incur penalties
- Avoid Plagiarism; ensure the work you submit is your own.