Probability and Statistics (ECE 3710)

Project 2

Instructor: Dr. Mohammad Shekaramiz

Submission type: Online, Canvas

In this project, you are asked to perform some simple tasks using MATLAB/PYTHON.

Google the average daily temperature for the last year in Orem or SLC, UT. This will serve as the population.

1) Compute the **mean** and **variance** of the **population**.
2) Use the method of **sample of convenience** and take **20** samples. Then, compute the **sample mean** and **sample variance**.
3) Use the **Simple Random Sample (SRS) method** and randomly select **20** samples. Then, compute the **sample mean** and **sample variance**.
4) Discuss the results obtained in parts (1), (2) and (3).
5) Plot the histogram of the population (set the length of bins to 10 degrees). Discuss what it shows.
6) Normalize the histogram data and plot it.
7) Plot the temperature population data. Use appropriate labels for the x- and y-axis (x demonstrates the day (eg., 1, 2, …) and y-axis shows the temperature). In the title of this figure, state when is the starting and ending date of your data.
8) On the same figure, show the population mean with a **red line**, the mean obtained from the SRS method with a **blue line**, and the mean from the method of sample of convenience with a **black line**. Use appropriate legends.
9) Predict the average temperature for **Sept. 1, 2023** based on the collected data using any polynomial that you think better fits the temperature data, and then find the coefficients using the least squares method. Include your code in your report and state what model you considered.

Good Luck