Assignment 1: Excel Skills and Basic Probability Calculations & Plotting

Reminders:

1. Make sure to watch tutorials of Excel available on YouTube. Here are three links, but there are hundreds of them available. Choose the ones you are comfortable with.

https://www.youtube.com/channel/UCYUPLUCkMiUgiyVuluCc7tQ

https://www.youtube.com/channel/UCkndrGoNpUDV-uia6a9jwVg

https://www.youtube.com/channel/UCRjlX8oZ5-El__sVBlvLwwg

2. Make sure to read the submission requirements in the course web site. Non-compliance with format requirements will result in loss of points.

Question 1-1: Creating Charts (50 points)

Create an Excel file which when completed will have 7 different sheets. One the first sheet: Create 1000 numbers in column A using the formula xxx*RAND() where xxx is the last three digits of your cell phone. If that number happens to be less than 50, add 50 to that number and use it for xxx. Repeat the same for column B, using yyy*RAND() where yyy is the last three digits of your student ID. If that number happens to be less than 75, add 75 to that number and use it for yyy. Fix the numbers to true two-digit decimal values. Copy Sheet1, four more times to new sheets (total, 5 sheets). Each sheet should be renamed Chart n: Chart Name where n =1, 2, 3, 4, 5 and Chart Name is the name of chart created on that sheet.

On Sheet1: Create 3 Line charts using Column A, Column B, and Columns A and B. Remember to name chart titles properly. Based on the instructions above, this tab should be named Chart 1: Line Chart. Use similar approach on subsequent sheets.

On Sheet2: 2 Histogram charts using Column A and Column B separately.

On Sheet3: 2 Pie charts using Column A and Column B separately.

On Sheet4: 3 Area charts using Column A, Column B, and Columns A and B.

On Sheet5: 3 Box and Whisker charts using Column A, Column B, and Columns A and B.

Question 1-2: Creating Plots (20 points)

The probability density function (pdf) of an exponential distribution is

$$f(x) = \begin{cases} \lambda e^{-\lambda x} & x \geq 0 \\ 0 & x < 0 \end{cases}$$

On Sheet6 (which is blank) Create 100 numbers in column A starting from 0.10 and increasing by 0.05 on each next cells (i.e., 0.10, 0.15, 0.20 and so on). These are your x values. On the next 6 columns (i.e., B, C, D, E, F, and G) use the formula to calculate $f(x)$. Use λ values of -9, -5, -1, +1, +5, and +9 on separate columns (i.e., -9 for column B, -5 for column C, and so on). Plot Columns A, B, C, and D together and A, E, F, and G together. Look at the two plots and make two observations about the impact of λ on $f(x)$.

The cumulative density function (cdf) of an exponential distribution is

$$F(x) = \int_0^x \lambda e^{-\lambda y} dy = \begin{cases} 1 - e^{-\lambda x} & x \geq 0 \\ 0 & x < 0 \end{cases}$$

On Sheet7 (which is blank) use similar procedure as you did for Sheet6 but use the new function. This time plot all 6 of them on the same plot. Look at the plots and make two observations.

Question 2: Calculating probability (30 points)

Three exactly similar unbiased dice is thrown at the same time. Add up the number of dots.

1. What is the probability that all three dice show odd numbers?

2. What is the probability that the total value is less than or equal 12?

3. What is the probability that there is at least one “6” among the thrown dice?

Assignment Submission

1. In paper format. Write a report explaining how you obtained your results including the charts

2. Full compliance with guidelines

3. Remember to submit the excel file through email before the deadline

4. Deadline for the submission is Thursday September 16^{th} at 5:00 PM.