IE6200: Engineering Probability and Statistics

Assignment: Lab 2

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Lab Assignment Guidelines

1. Students need to complete the Lab assignment individually.
2. All the Lab assignments are required to be done in RStudio.
3. Provide necessary comments using '#' for better understanding of your script.
4. The lab report needs to include the following sections:

   - **Problem statement:** A brief about your understanding on the assignment questions (maximum 3 lines)
   - **Output:** What were your finding after creating the code and running it in R. This section may include:
     - Graphs / charts / plots
     - Final data frame for your result
     - Results obtained
   - **Conclusion:** What were the statistical inferences and observations from the results obtained. ✓Students are not required to include codes in reports.

5. If you take help from any external source, please mention that in reference. Violating academic integrity policies may include zero credit on the work.

Deliverables:

1. Please submit a **.zip* file including the following items

   i. R script (just 1 file including all your codes)
   ii. Lab Report: Report with a maximum length of 10 pages including all appendices, tables, and graphs.

2. All of the above mentioned files have to be labeled as: 'Lab # - IE 6200 – Sec # - <Student Name>'
3. Submit your Lab deliverables via Canvas.

Task 1

Consider an experiment of rolling a die three times. Calculate the probabilities for the following events

- a) Find the probability of getting the same numbers on all three rolls of a die.
- b) Find the probability such that the sum of numbers on all three rolls of a die is greater than 6.
- c) Find the probablility of getting the number 2 on the first and second roll of a die and any number on the third roll of a die.

Task 2

Consider an experiment of tossing a coin three times. Calculate the probabilities for the following events

- a) Getting head on the first toss.
- b) Getting tail on the last toss.
- c) Getting all heads.
- d) Getting atleast 1 tail.

Task 3

Consider an experiment of sampling 2 balls from a urn containing 3 colored balls { red, green ,blue}. Provide only the sample space for the following conditions. Keep **ordered** = TRUE and **replacement** = TRUE.

Note: No need to find the probability for this problem only provide the sample space.

- a) All balls are of the same color
- b) Atleast 1 red colored ball

Task 4

Consider an experminet of drawing cards from a pack of cards. Calculate the following probabilites.

- a) The card belongs to the suit of diamonds.
- b) The card belongs to the suit of hearts and has a rank K.
- c) The card is either a Ace, King, Queen, Jack.
- d) The card is an Ace given it belongs to suit of clubs.