Assignment
Introduction to Probability and Statistics

1. A, marble is drawn at random from a bag containing 3 red and 2 blue marbles. The probability of drawing a black ball is:

    i. 1/5
    ii. 0/5
    iii. 2/5
    iv. 3/5

2. Consider a scenario where first event has occurred, given the probability of second event coined from the below options

    i. Series probability
    ii. Joint probability
    iii. Dependent probability
    iv. Conditional probability

3. About 7% of the population are left-handed. Suppose 2 people are selected at random from the U.K population. Because the sample size of 2 is very small relative to the population, it is reasonable to assume these two people are independent.
    i. What is the probability that two people are left-handed?
    ii. Find the probability for right hand too?

4. X and Y are two events which are considered as partially overlapping events then rule of addition can be written as
    i. P(X or Y) = P(X) * P(Y) + P(X - Y)
    ii. P(X or Y) = P(X) + P(Y) - P(X and Y)
    iii. P(X or Y) = P(X) - P(Y) + P(X and Y)
    iv. P(X or Y) = P(X) + P(Y) * P(X - Y)

5. SAM has $1000 and a certain commodity presently sells for $2 per ounce. After 1-week commodity will sell for either $1 or $4 an ounce., with two these possibilities equally likely. If objective is to maximize the expected amount of money that SAM possess at the end of week. What strategy should SAM employ?

6. In the email data set with 3,921 emails, 367 were spam, 2,827 contained some small numbers but no big numbers, and 168 had both characteristics. Create a Venn diagram for this setup.

    i. Use your Venn diagram from Question 5 to determine the probability a randomly drawn email from the email data set is spam and had small numbers (but not big numbers).
    ii. What is the probability that the email had either of these attributes?

7. Calculate the probability that the total of two dice will be greater than 9, given that the first die is a 5?

8. In an interview, two reasoning problems, 1 and 2, are asked. 35% job seekers solved problem 1 and 15% job seekers solved both the problems. What is the probability that job seekers who solved the first problem will also solve the second one?