1. Let us suppose, you have tossed two two-sided fair coins.
   a. Compute the PMF for heads in this experiment

   b. Compute Expectation of heads

2. For a given probability density function, calculate

$$f(x) = \begin{cases} 3x^{-4}, & x > 1 \\ 0, & elsewhere \end{cases}$$

   i) P(X = 2)
   ii) P(X <= 4)
   iii) P(X < 1)
   iv) P(2 <= X <= 3)

3. The joint probability distribution of two random variables X and Y is given by:
   $\mathrm{P}(\mathrm{X}=0,\mathrm{Y}=1)=\frac{1}{3}$, $\mathrm{P}(\mathrm{X}=1,\mathrm{Y}=-1)=\frac{1}{3}$, $\mathrm{P}(\mathrm{X}=1,\mathrm{Y}=1)=\frac{1}{3}$.

   Find i) Marginal distribution of X and Y.
   ii) Conditional probability distribution of X given Y=1.

4. Twelve volunteers were chosen for a blind-fold test to taste 2 soft-drinks A & B.

   i) What is the probability that 3 of them were able to correctly identify the drink that they had?
   ii) What is the probability at least 3 of them were able to correctly identify the drink that they had

5. Customers arrive at a bus station at the rate of 5 per minute.
   i) What is the probability of 3 arrivals in a one-minute interval?
   ii) What is the probability that no one arrives in a one-minute interval?

6. Player A scores an average of 70 runs with SD of 20 runs. Player B scores an average of 40 runs with SD of 10 runs. In a particular game, player A scored 75 runs and player B scored 55 runs. Which of these two players have done better when compared to their own personal track records?

7. A college basketball team has a shortage of one team member and the coach wants to recruit a player. To be selected for training the minimum height for recruitment is 72 inches. The average height of the students is 67.2 inches with a variance of 29.34. What is the probability that the coach finds a player from that college?

Assignment

8. In a distribution exactly normal, 10.03% of the items are under 25 kilogram weight and 89.97% of the items are under 70 kilogram weight. What are the mean and standard deviation of the distribution?

9. In a precision bombing attack there is a 50% chance that any one bomb will strike the target. Two direct hits are required to destroy the target completely. How many bombs must be must be dropped to give a 99% chance or better of completely destroying the target?