School of Computer Science Engineering and Technology

Course- B.Tech.   Type- Core
Course Code- CSET240   Course Name- Probability and Statistics
Year- 2024-25   Semester- ODD
Date--02-09-2024 to 06-09-2024   Batch-All

Lab (Week-6)

1. Calculate the covariance, which measures how much two datasets change together. Generate two lists of random data points as x_data and y_data, with the same number of data points. You can use the random module to generate random integers between 1 and 100. First, implement a function calculate_mean(data) to compute the mean of a dataset. Then, implement a function calculate_covariance(x_data, y_data) to calculate the covariance between the two datasets using their respective means.

2. Understanding the Concept of Pearson Correlation Coefficient, which Quantifies the Linear Relationship Between Two Sets of Data Points. You need to implement a Python program that calculates the Pearson correlation coefficient between two sets of data. Generate two lists of random data points, each containing 1000 data points. Implement functions to calculate the mean, standard deviation, and the Pearson correlation coefficient between the two datasets.

3. Given a discrete random variable representing the outcome of rolling a fair six-sided die, what is the PMF of this random variable?
    a. Calculate the PMF for each possible outcome of the die roll (i.e., the probability of rolling a 1, 2, 3, etc.).
    b. Construct the visual plot for the PMF.