

Concept of random variable, Discrete probability distribution, Probability mass function plot, probability histogram, Cumulative Distribution Function, CDF plot, Mathematical expectation and Variance of discrete random variable.

**Exercise questions:**

3.11, 3.12, 3.13, 3.22, 3.24, 4.1, 4.4,

Expectation and variance of function of discrete random variable, Properties of expectation and variance.

**Exercise questions:**

4.17, 4.55, 4.57,

Joint Probability distribution for discrete random variable, marginal distributions, conditional distribution for Y given X and X given Y, Expectation, variance, covariance, correlation and statistical independence.

**Exercise questions:**

3.39, 3.48, 3.49, 3.50, 3.51, 4.10, 4.51, 4.60, 4.97

Continuous random variable, PDF, CDF, Finding PDF and Probability by using CDF, Expectation and Variance of continuous random variable, Expectation and variance of function of continuous random variable, Finding probabilities from dual function.

**Exercise questions:**

3.6, 3.7, 3.9, 3.14, 3.21, 3.29, 3.36, 4.12, 4.20, 4.29, 4.50, 4.101

All questions from Walpole