TOPIC : 2.1- Introduction and Application of Two Dimensional Random Variables

Two-Dimensional Random Variables

Let S be the sample space. Let X = X(S) & Y = Y(S) be two functions each assigning a real number to each outcome s ∈ S. hen (X, Y) is a two dimensional random variable.

Types of random variables

1. Discrete Random Variables
2. Continuous Random Variables

Discrete Random Variables

f the possible values of (X, Y) are finite, then (X, Y) is called a two dimensional discrete R.V. and it can be represented by (xi, y), i = 1,2,….,m.

Continuous Random Variables

If (X, Y) can take all the values in a region R in the XY plans then (X, Y) is called two-dimensional continuous random variable.

Application of Discrete Random Variable

- If we want to find load on a specific point in a beam we can use discrete functions to find loading at each point on a beam.
- Suppose a loading on a long, thin beam places mass only at discrete points. The loading can be described by a function that specifies the mass at each of the discrete points. Similarly, for a discrete random variable X, its distribution can be described by a function that specifies the probability at each of the possible discrete values for X.

- Statisticians use sampling plans to either accept or reject batches or lots of construction material.
- Suppose one of these sampling plans involves sampling independently 10 items from a lot of 100 items in which 12 are defective.