

Probability Theory 3 - An Outline

Do we ever observe a probability distribution in real life? No. What we observe, are nothing but frequency distributions. However, when the total frequency is large enough, the relative frequencies may be taken to be good approximations of the corresponding probabilities. We may then try to 'match' our observed relative frequency distribution to one of the theoretically developed distributions, known as theoretical distributions for modeling the data on hand.

In this course of study, we shall learn some discrete, as well as some continuous theoretical distributions, how do they originate and some of their important properties. The problem of 'matching' a given relative frequency distribution with a theoretical distribution is, however, left for semester 6.

We shall further consider one discrete and one continuous joint distribution.

We shall also briefly study the scaling procedure using normal distribution.

Pre-requisites for this Course

1. Idea of limit and continuity.
2. Series of functions.
3. Improper integrals.
4. Idea of a random variable and its probability distribution.
5. Joint probability distribution.

Outcome of the Course

1. Knowledge of different theoretical distributions – both discrete and continuous.
2. The important properties of the theoretical distributions.
3. Inter-relations between different theoretical distributions.
4. Idea of modeling data through these distributions.
5. Idea of scaling.

References:

1. Mathematical Statistics – Parimal Mukherjee.
2. Introduction to the theory of Statistics – Mood, Graybill and Boes.
3. Introduction to Mathematical Statistics – Hogg and Craig.
4. Probability Models – Ross.
5. Introduction to Applied Statistics – a modeling approach – J.K.Lindsey.
6. An Outline of Statistical Theory (vol. I) – Gun, Gupta, Dasgupta.