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FACULTY OF ENGINEERING & TECHNOLOGY

Dr. Vinod Kumar Yadav
Assistant Professor in Mathematics
Rama University Uttar Pradesh, Kanpur

LECTURE- 18

BSc (AG)
2nd Year , IIIrd Sem.
Statistical Methods
AES-213

Dr. Vinod Kumar Yadav
Assistant Professor in Mathematics
Rama University Uttar Pradesh, Kanpur

Outline of lecture

- Probability Theory
- Introduction
- Definition & Formula
- Notations in Probability
- Addition & Multiplication theorem of Probability
- Suggested Readings & References

Introduction

Probability is a most important topic in Mathematics.

It is very much used in daily life, game theory, agriculture or predicting the result, share market, etc.

Probability is a mathematical measure of uncertainty.

Probability is also called chance of success or failure.

Let ‘A’ be an event, probability of A is denoted by P(A) and define as-

$$P(A) = \frac{favourable\ events}{total\ events}$$

The value of probability lies between 0 to 1. i.e.

$$P(A)=0 \quad or \quad P(A)=1 \quad or \quad 0<P(A)<1$$

Notation of Probability

Let A and B are two events so

P(A) define as probability of A or probability of success of A

$P(A')$ define as probability of A' or probability of failure of A

P(AUB) define as probability of A or B

P(A∩B) define as probability of A and B

Definitions

- Let A is an event. All possible outcomes in a trial are known as Exhaustive events.
- Two events A and B are said to be Mutually exclusive events if $P(A \cap B) = 0$.
- Two events A and B are said to be Independent events if $P(A \cap B) = P(A) \cdot P(B)$

Theorem of Probability

Let A and B are two events. P(A) define as probability of success A and

$P(A')$ probability of failure of A then

$$P(A)+P(A')=1$$

or

$$P(A')=1-P(A)$$

Addition & Multiplication Theorem of Probability

- Let A and B are two events then

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

this is called addition theorem of probability.

- Let A and B are two events then

$$P(A / B) \cdot P(B) = P(A \cap B)$$

this is called multiplication theorem of probability.

Suggested Readings & References

1) Statistical Methods: P.N. Arora, Sumeet Arora & S. Arora; S. Chand & Company Ltd.

2) Fundamental of Mathematical Statistics: S.C. Gupta & V. Kapoor; Sultan Chand & Sons.

3) Statistics: M.R. Spiegel; Schaum's Outline Series, Mc-Graw Hill Publication.

4) Advanced Engineering Mathematics: Erwin Kreyszig; John Wiley & Sons Inc.

5) Elements of Statistics: J.P. Chauhan & S. Kumar; Krishna Publication.

* THANK YOU *