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FACULTY OF ENGINEERING & TECHNOLOGY

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LECTURE- 21

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

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Outline of lecture

- Correlation
- Introduction
- Definition
- Examples
- Types of Correlation
- Karl Pearson's Formula
- Suggested Readings & References

Introduction

Correlation is one of the most widely used statistical method. In early stages, it was generally used in biological problems but later on its use has been extended to the field of economics, share bazaar, agriculture, psychology etc.

Definition

Two variables are related to each other such that change in one variable also change in other variable then variables are said to be correlated or the relationship between these variables is called correlation.

However, if change in one variable there is no change in other variable then variables are called Independent and no correlation.

Example of correlation

If there are perfect rainfall in India then increase in agricultural yield or increase in production of wheat results in fall of prices of wheat. These are related to each other so their is correlation between them.

Example of No correlation

In fresher's party of Agricultural I st year there is no effect on production of wheat in India. So no relation between these two things. Hence no correlation.

Types of Correlation

There are following types of correlation-

1) Positive correlation

2) Negative correlation

3) Linear correlation

4) Non-linear correlation

5) Perfect correlation

Perfect correlation are of two types-

i. Positive perfect correlation

ii. Negative perfect correlation

Karl Pearson's Coefficient of Correlation

Let x and y are two variables, Karl Pearson's Coefficient of correlation between x and y is denoted 'r' and define as-

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

where,

x = first series observations

y = second series observations

$\bar{x}$ = mean of first series

$\bar{y}$ = mean of second series

- The value of coefficient of correlation 'r' is lies between -1 to +1.

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 *