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FACULTY OF ENGINEERING & TECHNOLOGY

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LECTURE- 8

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

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Outline of lecture

- Measure of Central Tendency
- Definition
- Purpose
- Types
- Mean definition & formula
- Merits of Mean
- Demerits of Mean
- Test Your Skills (Questions based on Lecture)
- Suggested Readings & References

Measure of Central Tendency

Definition

One of the most important objective of the statistical analysis is to get one single value that describe the characteristic of the entire data such a value is called central value or an average value of the data. This value is called measure of central tendency.

Purpose

The purpose of computing a central value of the observations is to obtain a single value which represent all the observations.

Types

There are five types of measure of central tendency.

Measure of Central Tendency

1. ARITHMETIC MEAN or MEAN
2. MEDIAN
3. MODE
4. GEOMETRIC MEAN
5. HARMONIC MEAN

Properties (or Characteristic) of good measure of central tendency

- It is easy to understand.
- It is easy to calculate.
- It depends on all the observations (or values).
- It is not effected by extreme values (small or large values).
- It is capable of mathematical calculations.
- It is least affected by fluctuation of sampling.

Mean

Mean is denoted by $\bar{x}$ or μ.
Let $x_1, x_2, x_3, x_4, x_5, \ldots\ldots, x_n$ are n observations (or values) then

$$mean = \frac{sum\ of\ numbers}{total\ numbers\ (counted)}$$

$$\bar{x} = \frac{x_1 + x_2 + x_3 + x_4 + \ldots\ldots + x_n}{n}$$

when frequency is also given then

$$\bar{x} = \frac{\Sigma fx}{N}$$

where

$f = frequeny$

$x = observations\ or\ numbers$

$N = sum\ of\ frequency$

Properties of Mean

Merits or Advantages of Mean:

- Mean is easy to understand.
- Mean is easy to calculate.
- Mean depends on all the observations.
- Mean is rigidly defined by a mathematical formula.
- Mean is capable for mathematical calculations.
- Mean is least affected by fluctuation of sampling. This property is called " mean is stable measure of central tendency".

Demerits or Disadvantages of Mean:

- Mean is not determined by inspection.
- Mean is affected by extreme values.
- Mean is not obtained when single data is absent or missing.
- Mean is not used for qualitative data (Honesty, Beauty, Intelligence etc).

Test Your Skills (Fill in the blanks)

1. Why we use measure of central tendency……
2. Write one characteristic of good measure of central tendency …….
3. Write the number of types of measure of central tendency …..
4. Write the formula of mean ……..
5. Give reason why we called mean is stable measure of central tendency ……..
6. Find the mean of the numbers 4, 23, 56, 78, 234, 47. …….

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 *