

Chapter - 14 STATISTICS

HANDOUT(Module 1 of 4)

INTRODUCTION

- Statistics is a set of scientific principles and techniques that are useful in reaching conclusions about populations and processes when the available information is both limited and variable.
- Statistics is the science of learning from data .
- The objectives of statistics is to make an inference about a population of interest

Population versus Sample

Definition – A population is the set of all measurements of interest to the sample collector.

– A sample is any subset of measurements selected from the population.

Objective of Statistics

To make an inference about a population of interest based on information obtained from a sample of measurements from that population.

Why study Statistics

- Two reasons
 - To know how to evaluate published numerical facts.

- To interpret the results of sampling (survey or experimentation) or to employ statistical methods of analysis to make inferences in your works

Example

- The faculty senate at a major university with 35,000 students is considering changing the current grading policy from A, B, C, D, F to a plus and minus system--- that is, B+, B, B- rather than just B. The faculty is interested in the students' opinions concerning this change and will sample 500 students.
 - What is the population of interest?
 - What is the sample?
 - How could the sample be selected?
 - What type of questions should be included in the questionnaire?

Numerical Representation of Data

The numerical representation of data is called central tendency.

- Mean
- Median

Mode

Mean

The mean (or average) of observation is the sum of the values of all the observations divided by the total number of observations

Find the mean of 5,6,7,8,9

Mean = Sum of all observation/Total No of Observation

$$= (5+6+7+8+9)/5$$

$$= 35/5$$

$$= 7$$

Median of ungroup data

The median is the middle value of a distribution

First we arrange the data in ascending order

If n is the odd number of observation, then $(n+1)/2$ place of observation is the median.

If n is the even number of observation, then $(n/2)$ and $(n/2+1)$ place of observation is the median.

Find the median of 8,3,4,6,5,9,8

First we arrange the data in ascending order

3,4,5,6,8,8,9

Here $n = 7$

$$(n+1)/2 = (7+1)/2$$

$$= 8/2$$

= 4 th place of data

Hence the median = 6

Mode of ungroup data

The mode of a distribution is the value of the observation for which the frequency is maximum

Find the mode of the following data. 5,6,4,7,8,5,6,4,8,5,3,5

Data	Frequency
3	1
4	2
5	4
6	2
7	1
8	2

Mode= 5