

Date: 20/04/15

(Lecture)
5,6
7,8

• Book: - Probability & Statistics by Walpole

-: Chapter no 1:-

We discussed about these two topics:-

- Statistical Inference
- Uncertainty & Variations.

-: Probability :-

- It has range from 0 to 1.

Sampling Procedures:-

in this, we will discuss about random sampling.

Types of Random Sampling:-

- Biased Sampling
- Stratified Sampling.

1) Biased Sampling:-

In this process, we sampled things without any category or without any plans.

2) Stratified Sampling:-

In this type, we categorized things. We made different strata. Strata means grouping different things having homogeneous properties.

Measures of Location:-

- Sample Mean

Suppose we have unlimited values x_1, x_2, x_3, \dots

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n} = \frac{x_1 + x_2 + x_3 + \dots}{n}$$

- Sample Size:- (n)

Number of elements in a sample is called Sample Size.

• Sample Median:-

$$K = \begin{cases} \frac{x_{(n+1)}}{2} & \text{if we have } n = \text{odd} \\ \frac{1}{2} \left(\frac{x_n}{2} + x_{(n/2)+1} \right) & \text{if } n = \text{even} \end{cases}$$

Important Question:-

Why we need to find both Mean & Median?

Answer:- • Mean value affects by extreme values (high & low)

• So we find median, it does not affected by extreme values. It is actually alternative of mean.

• Trimmed Mean:-

It is used where we don't want extreme values to interfere in results.

How to calculate it?

→ We will find out required % age of given data & then will delete values (high & low)

For example-

1, 3, 7, 20, 25 is series of results
we will find out 10% of it,

$$\frac{10}{100} \times 5 = 0.5 = 1$$

So we will delete 1 value from top (highest) and one from below (lowest) and then calculate normal mean.

• Measure of Variability:-

The space of variation or inconsistency in final result is called variability.

1) Sample Range

The Minimum & Maximum values in (any) result is sample range

2) Sample Variance

It is actually Standard Deviation.

$$\text{Standard Variance} = s^2 = \sum_{i=1}^n \frac{(x_i - \bar{x})^2}{n-1} \quad (\text{Non-Linear})$$

$$\text{Standard Deviation} = s = \sqrt{s^2} \quad (\text{Linear})$$

