

CHAPTER 14

Statistics

Median:

Median is defined as the middle most or the central value of the observations, when the observations are arranged either in ascending (or) descending order of their magnitudes.

Median of ungrouped data:

Let $x_1, x_2, x_3 \dots x_n$ be the 'n' observations, then median is computed by following steps.

Step – 1:

Arrange the given data in ascending or descending order.

Step – 2:

Determine the total number of observations. Say 'n'

Step – 3:

Case (I):

If 'n' is odd,

Median = Value of the $\left(\frac{n+1}{2}\right)^{\text{th}}$ observation.

Case (II):

If 'n' is even,

Median =
$$\frac{\text{Sum of values of the } \left(\frac{n}{2}\right)^{\text{th}} \& \left(\frac{n}{2}+1\right)^{\text{th}} \text{ observation}}{2}$$

Example:

Find the median of 10 observations 14, 36, 25, 28, 35, 32, 56, 42, 50 and 61.

Sol.

By ascending order of given data,

14, 25, 28, 32, 35, 36, 42, 50, 56, 61

No. of observations (n) = 10 (Even number)

$$\text{Median} = \frac{\left(\frac{n}{2}\right)^{\text{th}} + \left(\frac{n}{2} + 1\right)^{\text{th}} \text{ observation}}{2}$$

$$\begin{aligned} &= \frac{\left(\frac{10}{2}\right)^{\text{th}} + \left(\frac{10}{2} + 1\right)^{\text{th}}}{2} \\ &= \frac{5^{\text{th}} + 6^{\text{th}}}{2} \\ &= \frac{35 + 36}{2} \end{aligned}$$

Median = 35.5