Median

Understanding: Median

- Median is the middle value of the data when it is arranged in ascending or descending order
- It is one of the three measures of central tendency along with mean and mode
- Median is useful when we want the central position of a data set, especially when there are extremely high or low values

Steps to Find the Median

- Step 1: Arrange the data in ascending or descending order
- Step 2: Count the number of values (n)
- If n is odd, median = value at $\frac{n+1}{2th}$ position
- If n is even, median = average of the values at $\frac{n}{2}$ and $(\frac{n}{2} + 1)$ positions

Important Point

- Median is not affected by very large or small values
- It shows the central tendency better in some cases than the mean

Examples with Solutions

Example: Find the median age of these persons.

Solution: Arranging the ages (in years) in ascending order, we get

23,27,28,32,32,35,36,39,40,45,46,55

Here, the number of observations in n = 12, which is even.

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

Median age = $\frac{6^{th}observation + 7^{th}observation}{2}$
= $\frac{35+36}{2}$ years = $\frac{71}{2}$ years
= 35.5 years

Example: Data: 4, 2, 6, 8 Arrange: 2, 4, 6, $8 \rightarrow n = 4$ (even) Median = $\frac{4+6}{2} = \frac{10}{2} = 5$ Median = 5 Example: Data: 12, 15, 10, 18, 14 Arrange: 10, 12, 14, 15, $18 \rightarrow n = 5$ Median = value at 3rd position = 14 Median = 14Example: Data: 21, 17, 13, 25, 19, 23 Arrange: 13, 17, 19, 21, 23, 25 → n = 6 Median = $\frac{19+21}{2} = \frac{40}{2} = 20$ Median = 20 Example: Data: 5, 8, 12, 4, 10, 7, 9 Arrange: 4, 5, 7, 8, 9, 10, $12 \rightarrow n = 7$ Median = value at 4th position = 8 Median = 8

Summary Points

- Median is the middle value of arranged data
- If number of values is odd, pick the middle one
- If number of values is even, take average of two middle values
- Median is not affected by extreme values
- It helps in understanding the central location of the data