

CHAPTER 14

Statistics

Method of calculating median for ungrouped frequency distribution:

In case of ungrouped frequency distribution, median is calculated as follows:

Case (i):

If 'n' is odd, then median = Value of $\left(\frac{n+1}{2}\right)^{\text{th}}$ observation

Case (ii):

If 'n' is even, then median = $\frac{1}{2} \times$ Value of $\left[\left(\frac{n}{2}\right)^{\text{th}} + \left(\frac{n}{2} + 1\right)^{\text{th}}\right]$ observations.

For the value of observations, first look at the cumulative frequency just greater than (and nearest to) the position of required observations. Then, determine the corresponding value of the observation.

Example:

Find the median of the following data.

Marks obtained	20	29	28	33	42	38	25
No. of students	6	28	24	15	30	4	20

Sol.

First, we arrange the marks obtained in ascending order and make a cumulative frequency table as follows:

Marks obtained (x_i)	No. of students (f_i)	Cumulative frequency (C.f)
20	6	6
25	20	6 + 20 = 26
28	24	26 + 24 = 50
29	28	50 + 28 = 78
33	15	78 + 15 = 93
38	04	93 + 4 = 97
42	02	97 + 2 = 99

Here, $n = 99$, total number of observations, which is odd.

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

$$= \text{Value of } \left(\frac{99 + 1}{2} \right)^{\text{th}} \text{ observation}$$

Median = Value of 50th observation

Now, the value of x_i corresponding to cumulative frequency 24 is 28. Therefore, median is 28.

