14.2 Median

The median is the central value of the set of observations provided all the observations are arranged in the ascending or descending orders. It is generally used, when effect of extreme items is to be kept out.

(1) **Calculation of median**

(i) **Individual series:** If the data is raw, arrange in ascending or descending order. Let n be the number of observations.

If n is odd, Median = value of $\left(\frac{n+1}{2}\right)^{th}$ item.

If n is even, Median = $\frac{1}{2}\left[\text{value of}\left(\frac{n}{2}\right)^{\text{th}}\text{ item} + \text{value of}\left(\frac{n}{2}+1\right)^{\text{th}}\text{ item}\right]$

(ii) **Discrete series:** In this case, we first find the cumulative frequencies of the variables arranged in ascending or descending order and the median is given by Median = $\left(\frac{n+1}{2}\right)^{th}$ observation, where n is the cumulative frequency.

(iii) **For grouped or continuous distributions :** In this case, following formula can be used.

(a) For series in ascending order, Median = $l + \frac{\left(\frac{N}{2} - C\right)}{f} \times i$

Where l = Lower limit of the median class

f = Frequency of the median class

N = The sum of all frequencies

i = The width of the median class

C = The cumulative frequency of the class preceding to median class.

(b) For series in descending order

Median = $u - \left(\frac{\frac{N}{2} - C}{f}\right) \times i$, where u = upper limit of the median class, $N = \sum_{i=1}^{n} f_i$.