

Harmonic Mean: The use of harmonic mean is very limited in statistics. However it is useful where two averages are computed under different prevailing conditions.

$$\text{Harmonic Mean} = \frac{n}{\sum 1/x}$$

Example: What is the harmonic mean of 5, 9, 15, 30?

Solution

$$\begin{aligned} \text{Harmonic Mean} &= \frac{4}{\frac{1}{5} + \frac{1}{9} + \frac{1}{15} + \frac{1}{30}} \\ &= \frac{4}{\frac{18 + 10 + 6 + 3}{90}} \\ &= \frac{4}{\frac{37}{90}} \\ &= \frac{4 \times 90}{37} \\ &= 9.73 \end{aligned}$$

Median: The median of a set of number is the number that falls in the middle position after arranging them in ascending or descending order of magnitude. If the number of observation in the sample is an odd number, the median is obtained as the mean or average of the middle numbers in the ordered array.

Example: Find the median of the numbers 6, 5, 8 and 10.

Solution

Rearrange in ascending order (i.e. least value to the highest value)

5, 6, 8, 9, 10

The median is $\frac{(5 + 1)th}{2}$

$$= \frac{6}{2}$$

= 3rd position

5, 6, 8, 9, 10

Therefore, Median is 8

Example: Find the median of the numbers 68, 54, 78, 46, 48, 67

Solution

Rearrange 46, 48, 54, 67, 68, 78

Median falls between 3rd and 4th

$$\text{Median} = \frac{54 + 67}{2} = \frac{121}{2} = 60.5$$

For grouped data: Median can be calculated using formula method.

Formula Method:

$$\text{Median} = L1 + \frac{(N/2 - Cf) C}{Fm}$$

L1= lower class boundary of the median class.

N = Number of data

Cf = cumulative frequency of the class before the median class.