

14.4 MODE

Mode or modal value of the distribution is that value of variable for which the frequency is maximum.

Mode of ungrouped data : - (By inspection only)

Arrange the data in an array and then count the frequencies of each variate.

The variate having maximum frequency is the mode.

Mode of continuous frequency distribution

$$\text{Mode} = \ell + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$$

Where ℓ = lower limit of the modal class

f_1 = frequency of the class i.e. the largest frequency.

f_0 = frequency of the class preceding the modal class.

f_2 = frequency of the class succeeding the modal class.

h = width of the modal class

Ex.12. Find the mode of the following data :

25, 16, 19, 48, 19, 20, 34, 15, 19, 20, 21, 24, 19, 16, 22, 16, 18, 20, 16, 19.

Sol. Frequency table for the given data as given below :

Value x_i	15	16	18	19	20	21	22	24	25	34	48
Frequency f_i	1	4	1	5	3	1	1	1	1	1	1

19 has the maximum frequency of 5. So, Mode = 19.

Ex.13. The following table shows the age distribution of cases of a certain disease admitted during a year in a particular hospital.

Age (in Years)	5-14	15-24	25-34	35-44	45-54	55-64
No. of Cases	6	11	21	23	14	5

Sol. Here class intervals are not in inclusive form. So, Converting the above frequency table in inclusive form.

Age (in Years)	4.5-14.5	14.5-24.5	24.5-34.5	34.5-44.5	44.5-54.5	54.5-64.5
No. of Cases	6	11	21	23	14	5

Class 34.5 - 44.5 has maximum frequency. So it is the modal class.

ℓ 34.5, h = 10, f_0 = 21, f_1 = 23 and f_2 = 14.

$$\therefore \text{Mode} = \ell + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$$

$$\text{Mode} = 34.5 + \frac{23 - 21}{46 - 21 - 14} \times 10$$

$$= 34.5 + \frac{2}{11} \times 10$$

$$= 36.31 \text{ Ans.}$$

Ex.14 Find the mode of following distribution :

Daily Wages	31-36	37-42	43-48	49-54	55-60	61-66
No. of workers	6	12	20	15	9	4

Sol.

Daily Wages	No. of workers	Daily wages	No of workers
31-36	6	30.5-36.5	6
37-43	12	36.5-42.5	12
43-48	20	42.5-48.5	20
49-54	15	48.5-54.5	15
55-60	9	54.5-60.6	9
61-66	4	60.5-66.5	4

Modal class frequency is 42.5 - 48.5.

$$l = 42.5$$

$$f_1 = 20 \quad f_0 = 12, f_2 = 15, h = 6$$

$$\therefore \text{Mode} = 42.5 + \frac{20 - 12}{2(20) - 12 - 15} \times 6$$

$$\therefore \text{Mode} = 46.2$$

Merits of Mode

- (i) It can be easily understood and is easy to calculate.
- (ii) It is not affected by extreme values and can be found by inspection in some cases.
- (iii) It can be measured even if open - end classes and can be represented graphically.

Demerits of Mode:

- (i) It is ill - defined. It is not always possible to find a clearly defined mode.
- (ii) It is not based upon all the observation.
- (iii) It is not capable of further mathematical treatment. it is after indeterminate.
- (iv) It is affected to a greater extent by fluctuations of sampling.

Uses of Mode:

Mode is the average to be used to find the ideal size, e.g., in business forecasting, in manufacture of ready-made garments, shoes etc.

Relation between Mode, Median & Mean : Mode = 3 median - 2 mean.