

# Vidyasagar University

Department of Library and Information Science

Course – Bachelor of Library and Information Science

Paper No: BLI - 202

Paper Name - Management of Libraries and Information Centres – II

Unit – 4: Measurement of Central Tendency

Material No – 04

**Mode** – Mode of a given set of observations is that value which occurs with the maximum frequency.

## Calculation of Mode:

### A) From ungrouped data

Arrange the data in ascending or descending order of magnitude. Mode can be determined by locating that value, which has been occurred the maximum number of times.

### Example 1:

Calculate mode from the following data:

Price/ book – 75, 100, 85, 130, 150, 125, 95, 110, 140, 105, 135, 110, 80, 90, 145

### Solution:

Arrange the data in ascending order.

Price/ book – 75, 80, 85, 90, 95, 100, 105, 110, 110, 125, 130, 135, 140, 145, 150

The price of book having Rs 110 has occurred two times.

So, average price of the books is Rs 110.

### B) From simple frequency distribution

In case of simple frequency distribution mode can be determined by inspection only. It is that value which occurs with the maximum frequency.

### Example 2: (Example – 2 of Material No – 1)

The table given below shows the price and number of books holding of a library. Find out mode.

Price/ book (Rs):	30	40	50	60	70	80	90	100	110	120	130	140	150
No of books:	5	8	12	15	20	25	45	40	30	20	15	10	5

**Solution:** Here, the values of the variables are in ascending order.

Price/ book (Rs)	No of books
(x)	(f)
30	5
40	8
50	12
60	15
70	20
80	25
90←	45←
100	40
110	30
120	20
130	15
140	10
150	5

It is found from the frequencies of the values of the variable that books having priced of Rs 90 have maximum frequency ie, 45. So, the mode will be 90. Here, the assumption is that items having average value will occur maximum times in a set of observations.

### **B) From group frequency distribution**

If all classes are of equal width, mode is usually calculated by the formula –

$$\text{Mode} = l_1 + \frac{d_1}{d_1 + d_2} * c$$

Where,  $l_1$  = lower boundary of the modal class

$d_1$  = difference of the largest frequency and the frequency of the class just preceding the modal class

$d_2$  = difference of the largest frequency and the frequency of the class just following the modal class

$c$  = common width of classes

Modal class = the class with maximum frequency

**Example 3:**

Calculate mode from the following frequency distribution:

No of books catalogued per day:	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60
No of days in a year:	32	35	42	48	36	30	24	19	16

**Solution:**

As this is a problem of group frequency distribution so before applying the specific formula it needs to identify the modal class.

No of books catalogued/ day	No of days
15-20	32
20-25	35
25-30	42
(30-35)←	48←
35-40	36
40-45	30
45-50	24
50-55	19
55-60	16

-----  
Here the modal class is (30-35) as it has the maximum frequency.

By applying the formula  $\text{mode} = l_1 + \frac{d_1}{d_1+d_2} * c$

Where,  $l_1$  = lower boundary of the modal class

$d_1$  = difference of the largest frequency and the frequency of the class just preceding the modal class

$d_2$  = difference of the largest frequency and the frequency of the class just following the modal class

$c$  = common width of classes

$$\begin{aligned}\text{Mode} &= 30 + \frac{48-42}{(48-42)+(48-36)} * 5 \\ &= 30 + \frac{6}{6+12} * 5 \\ &= 30 + \frac{6}{18} * 5 \\ &= 30 + \frac{1}{3} * 5 \\ &= 30 + \frac{5}{3} \\ &= 30 + 1.66 \\ &= 31.66 \\ &= 32 \text{ (Approx)}\end{aligned}$$

Therefore, average books catalogued (mode) per day is 32.

#### Example 4:

From the following frequency distribution table calculate mode of number of times a book has been consulted in a given library out of a random sampling of 700 books.

No of times consulted:	up to 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
No of books:	75	70	80	100	125	90	60	50	30	20

#### Solution:

Here, the classes are in class boundary and the width of the classes is same. So, mode can be applied to solve the problem. But, for the first class it is to be taken that the width of the class is 5.

No of times consulted	No of books
up to 5	75
5-10	70
10-15	80
15-20	100
(20-25)←	125←
25-30	90

30-35	60
35-40	50
40-45	30
45-50	20

---

Here, the modal class is (20-25) as it has the highest frequency of 125.

By applying the formula  $\text{mode} = l_1 + \frac{d_1}{d_1+d_2} * c$

Where,  $l_1$  = lower boundary of the modal class

$d_1$  = difference of the largest frequency and the frequency of the class just preceding the modal class

$d_2$  = difference of the largest frequency and the frequency of the class just following the modal class

$c$  = common width of classes

$$\begin{aligned}
 \text{Mode} &= 20 + \frac{125-100}{(125-100)+(125-90)} * 5 \\
 &= 20 + \frac{25}{25+35} * 5 \\
 &= 20 + \frac{25}{60} * 5 \\
 &= 20 + \frac{125}{60} \\
 &= 20 + 2.08 \\
 &= 22.08 \\
 &= 22 \text{ (Approx)}
 \end{aligned}$$

Therefore, average number of times a book has been consulted is 22.