Chapter – 14

STATISTICS

Module 4 of 4

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Mode of Group Data

Mode

The mode or modal value is that value of the variate which occurs most frequently.

To find the mode of a grouped data, we proceed as follows:

- Obtain the grouped data.
- Locate the class having maximum frequency. This class is called modal class.
- Mode of a grouped data is given by the formula

$$\text{Mode} = l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) \times h$$

where l = lower limit of the modal class

f_1 = frequency of the modal class

f_0 = frequency of the class preceding the modal class

The marks distribution of 30 students in a science examination are as follows. Find the mode of this data

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MO	10	20	36	40	50	56	60	70	72	80	88	92	95
No	1	1	3	4	3	2	4	4	1	1	2	3	1

Solution. First, we will make the class interval with class size of 15.

Class interval	*Number of students*	
10–25	2	
25–40	3	→ f_0
40–55	7	→ Model class → $f_1 = 7$
55–70	6	→ f_2
70–85	6	
85–100	6	
Total	$\Sigma f_i = 30$	

Since the maximum number of students (7) have got marks in the interval 40–55 is 40–55.

So

lower limit of the model class, l = 40

class size, h = 15

frequency, f_1 of the model class = 7

frequency, f_0 of the class preceding the model class = 3

frequency, f_2 of the class succeeding the model class = 6

Now, using the formula

Find the mode of the following data

Class	0-20	20-40	40-60	60-80	80-100	100-120	120-140
Frequency	6	8	10	12	6	5	3

SOLUTION Clearly, the modal class is 60–80, as it has the maximum frequency.

$\therefore \quad x_k = 60, h = 20, f_k = 12, f_{k-1} = 10, f_{k+1} = 6.$

$$\text{Mode, } M_o = x_k + \left\{ h \times \frac{(f_k - f_{k-1})}{(2f_k - f_{k-1} - f_{k+1})} \right\}$$

$$\text{Mode, } M_o = x_k + \left[\quad (2f_k - f_{k-1} - f_{k+1}) \right]$$

$$= 60 + \left\{ 20 \times \frac{(12 - 10)}{(2 \times 12 - 10 - 6)} \right\}$$

$$= 60 + \left\{ 20 \times \frac{2}{} \right\} = 60 + \left\{ 20 \times \frac{2}{8} \right\} = 6$$

The distribution of sale of shirts sold in a month in a department store is as under

Size (in cm)	80-85	85-90	90-95	95-100	100-105	105-110	110-115
No of Shirt Sold	33	27	85	155	110	45	15

SOLUTION Clearly, the modal class is 95–100 as it has the maximum frequency.

$\therefore \quad x_k = 95, h = 5, f_k = 155, f_{k-1} = 85, f_{k+1} = 110.$

$$\text{Mode, } M_o = x_k + \left\{h \times \frac{(f_k - f_{k-1})}{(2f_k - f_{k-1} - f_{k+1})}\right\}$$

$$= 95 + \left\{5 \times \frac{(155 - 85)}{(2 \times 155 - 85 - 110)}\right\}$$

$$= 95 + \left\{5 \times \frac{70}{(310 - 195)}\right\} = 95 + \left\{5 \times \frac{70}{115}\right\}$$

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THANK YOU