Assignment 1

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Question: 3 (c)

Runs Scored	3000-4000	4000-5000	5000-6000	6000-7000	7000-8000	8000-9000	9000-10000
No. of batsmen	4	18	9	6	7	2	4

Table 1.1

Using a graph paper draw a histogram for the given distribution showing the number of runs scored by 50 batsmen. Estimate the mode of the data.

Solution:

The Histogram for the data given in Table 1.1 is plotted as shown in Fig: 1.1.
The approach for calculating mode is outlined in Fig: 1.2. The interval corresponding to the maximum number of batsmen is the mode class. The intersection of the lines PQ and RS as shown in Fig 1.2 (Point M) is the mode point. The required mode is the x-coordinate of the Mode point.

$$\text{P} = \begin{pmatrix} 5000 \\ 18 \end{pmatrix} \quad \text{Q} = \begin{pmatrix} 4000 \\ 4 \end{pmatrix}$$
$$\text{R} = \begin{pmatrix} 4000 \\ 18 \end{pmatrix} \quad \text{S} = \begin{pmatrix} 5000 \\ 9 \end{pmatrix}$$

Equations of lines are as follows:

$$PQ : 14x - 1000y = 52000$$
$$RS : 9x + 1000y = 54000$$

Adding both the equations, we get

$$23x = 106000$$
$$x = 4068.695$$

From this we can get the y-coordinate as follows:

$$1000y = 52000 + 14x$$
$$1000y = 52000 + 56961.73$$
$$y = 12.521$$

Mode point is the point of intersection of lines PQ and RS.
Therefore mode point is

$$\mathrm{M} = \begin{pmatrix} 4068.695 \\ 12.521 \end{pmatrix}$$

Therefore, the mode is 4068.695.

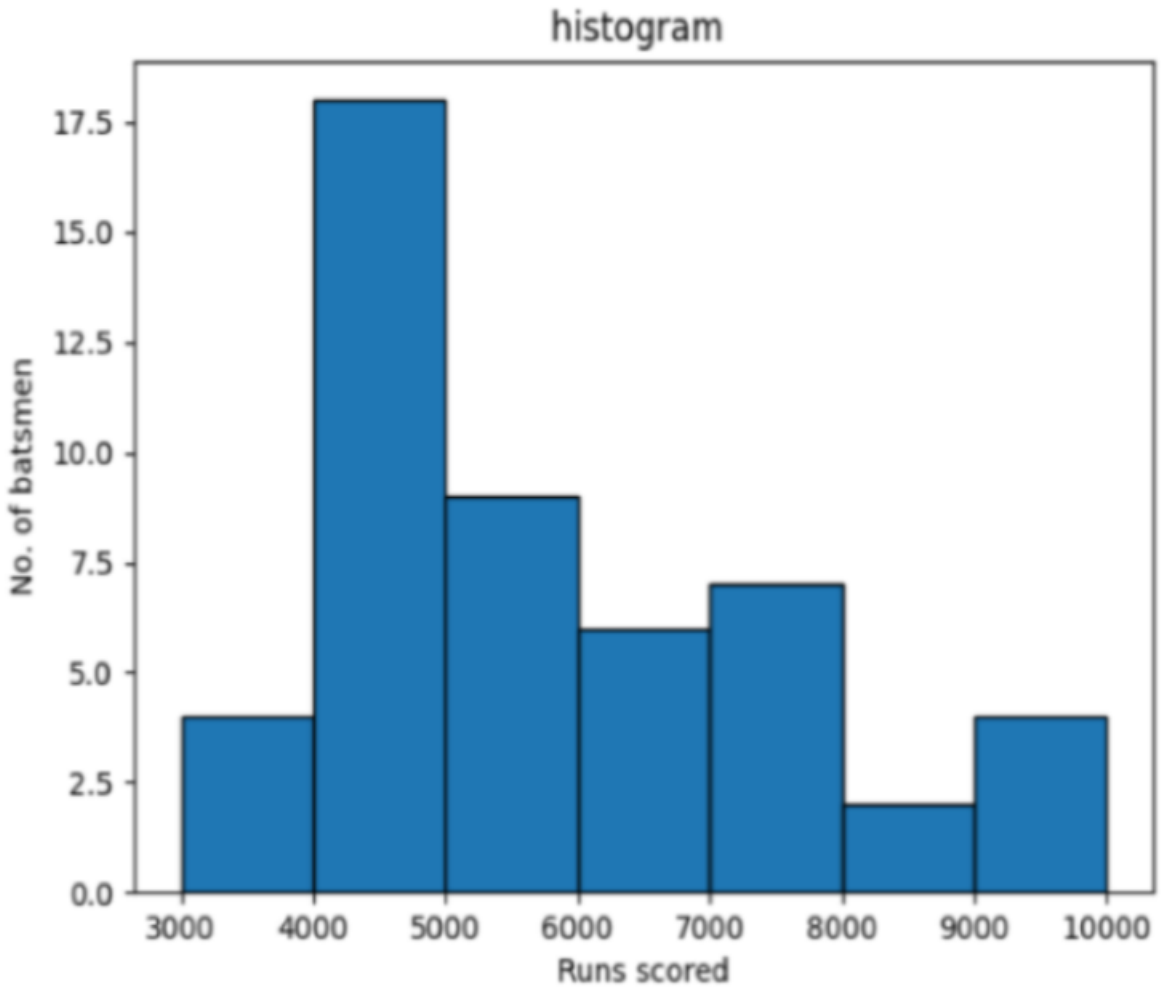

Fig: 1.1

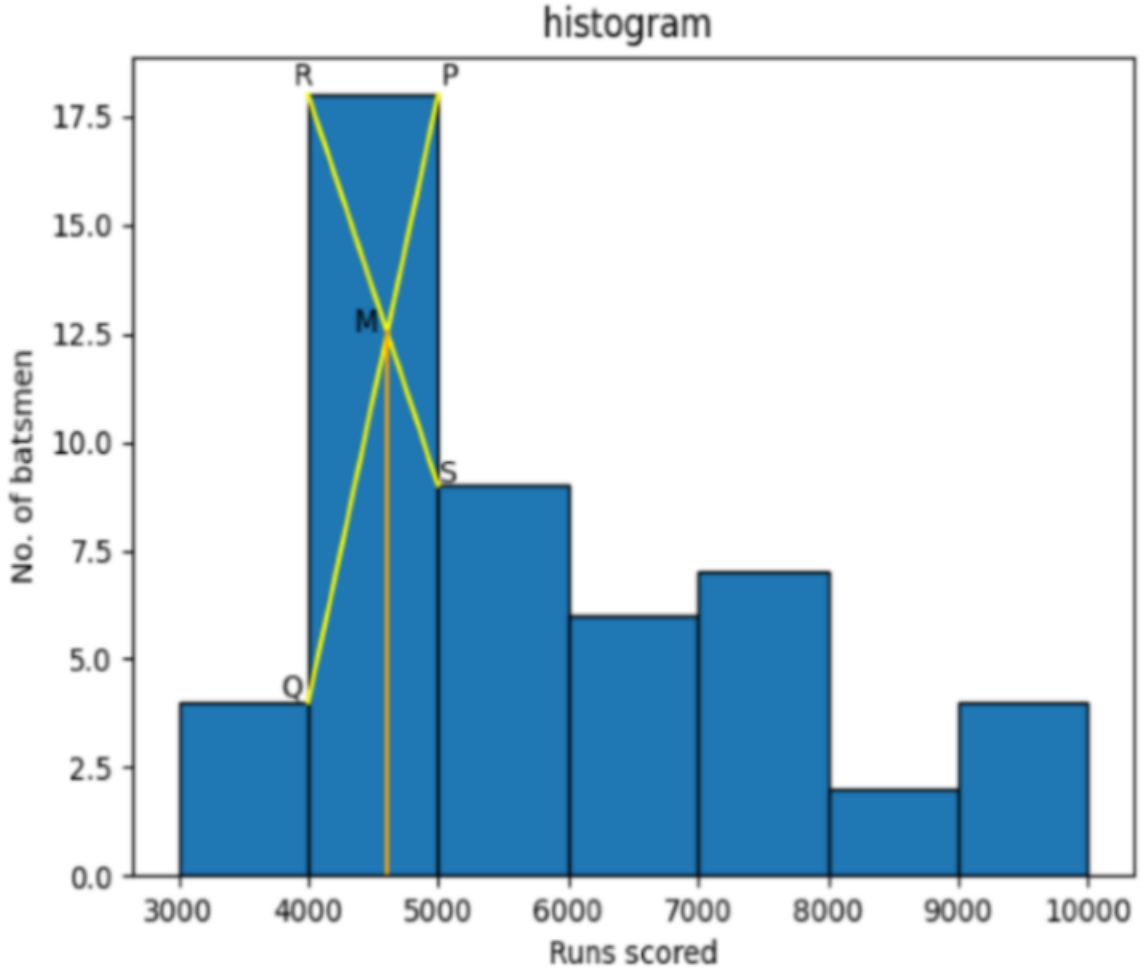
histogram
R
P
M
Q
S
No. of batsmen
Runs scored
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
3000
4000
5000
6000
7000
8000
9000
10000

Fig: 1.2