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Chapter- 3: Data Handling

Exercise 3.1 (Page 62)

Q1. Find the range of the heights of any 10 students of your class.

Difficulty Level: Easy

What is the given / known? The height of ten students.

What is unknown:

Tthe range of heights

Reasoning:

Range= Highest value – Lowest value

Solution: -

Serial no.	Name of the students	Height (in cm)
1	Yash	126
2	Nidhi	128
3	Toshi	134
4	Abhishek	148
5	Dimple	146
6	Parul	132
7	Neha	129
8	Ananya	137
9	Arya	127
10	Dipti	130

 $\therefore \text{ Range} = \text{Highest value} - \text{Lowest value}$ Highest value among this observation = 148 Lowest value among this observation = 126 $\therefore \text{ Range} = 148 - 126 = 22 \text{ cm}$

Q2. Organize the following marks in a class assessment, in a tabular form.

- 4, 6, 7, 5, 3, 5, 4, 5, 2, 6, 2, 5, 1, 9, 6, 5, 8, 4, 6, 7
 - (i) Which number is the highest?
- (ii) Which number is the lowest?
- (iii) What is the range of the data?
- (iv) What is the arithmetic mean?

Difficulty Level: Easy



Marks in a class assessment?

What is unknown:

Highest marks, lowest marks, range, arithmetic mean

Reasoning:

Range = Highest marks – Lowest marks

Solution: -

Marks	Tally marks	No. of students
		(Frequency)
1	Ι	1
2	II	2
3	Ι	1
4	III	3
5	TH	5
6	IIII	4
7	II	2
8	Ι	1
9	Ι	1

- (i) The highest number is 9.
- (ii) The lowest number is 1.
- (iii) The range of the data = Highest number Lowest number no.

$$=9-1 = 8$$

(iv) Arithmetic mean $= \frac{\text{Sum of all numbers}}{\text{Transformed}}$

 $=\frac{4+6+7+5+3+5+4+5+2+6+2+5+1+9+6+5+8+4+6+7}{2}$

20

$=\frac{100}{20}$

= 5

Q3. Find the mean of the first 5 whole numbers.

Difficulty Level: Easy

What is the given / known:

First 5 whole numbers.

What is unknown:

Mean of first 5 whole numbers.

Reasoning:

Mean of first five whole numbers =

Sum of all numbers Total numbers



Solution: -

The first five while numbers are 0, 1, 2, 3, 4 Mean = $\frac{\text{Sum of all numbers}}{\text{T}}$

Total numbers

$$= \frac{0+1+2+3+4}{5}$$

$$= \frac{10}{5}$$

$$= 2$$

Thus, the mean of first five whole numbers is 5.

Q4. A cricketer scores the following runs in eight innings: 58, 76, 40, 35, 46, 45, 0, 100. Find the mean score.

Difficulty Level: Easy

What is the given /known: Runs in eight innings.

What is unknown: Mean Score

Reasoning:

Mean of score = $\frac{\text{Sum of all runs}}{\text{Number of innings}}$

Solution: -

Total number of innings = 8 Scores of cricketer in 8 innings = 58, 76, 40, 35, 46, 45, 0, 100 Mean of score = $\frac{58 + 76 + 40 + 35 + 46 + 45 + 0 + 100}{8}$ = $\frac{400}{8}$ = 50

Thus, the mean score of a cricketer in 8 innings is 50.



Q5. Following table shows the point of each player scored in four games: -

Player	Game 1	Game 2	Game 3	Game 4
А	14	16	10	10
В	10	8	6	4
С	8	11	Didn't play	13

Now answer the following questions: -

- (i) Find the mean to determine A's average number of points scored per game.
- (ii) To find the mean number of points per game for C, would you divide the points by 3 or 4? Why?
- (iii) B played in all the four games. How would you find the mean?
- (iv) Who is the best performer?

Difficulty Level: Easy

What is the given /known:

Point of each player scored in four games.

What is unknown:

Average score, Mean

Reasoning:

 $Mean = \frac{Sum of score}{Number of games}$

Solution: -

(i) Total number of games played by A = 4
Scores obtained by A = 14, 16, 10, 10
Mean score of A =
$$\frac{14+16+10+10}{4}$$

= $\frac{50}{4}$
= 12.5

ii) We should divide total points by 3 because player C played only three games.



iii) Total number of games played by B = 4 Scores obtained by B = 0, 8, 6, 4 Mean score of B = $\frac{\text{Sum of scores by B}}{\text{No. of games played by B}}$ = $\frac{0+8+6+4}{4}$ = $\frac{18}{4}$ = 4.5 iv) To find the best performer, We should find the mean of all players. Mean of player A = 12.5 Mean of player B = 4.5 Mean of player C = $\frac{\text{sum of scores by C}}{\text{No. of games played by C}}$ = $\frac{8+11+13}{3}$ = $\frac{32}{3}$ = 10.67

Therefore, on comparing means of all players, A is the best performer.

- **Q6**. The marks (Out of 100) obtained by a group of students in a science test are 85, 76, 90, 85, 39, 48, 56, 95, 81, 75. Find the: -
 - (i) Highest and lowest marks obtained by the students.
 - (ii) Range of the marks obtained.
 - (iii) Mean marks obtained by the group.

Difficulty Level: Easy

What is the given /known:

Marks obtained by a group of students in a science test.

What is unknown:

Highest and lowest marks, Range of the marks, Mean marks

Reasoning:

Mean marks = $\frac{\text{Sum of marks}}{\text{Total no.of students}}$



Marks obtained by the group of students = 85, 76, 90, 85, 39, 48, 56, 95, 81, 75

(i) Highest marks obtained by the student = 95

Lowest marks obtained by the student = 39

(ii) Range of the marks = Highest marks – Lowest marks = 95 - 39= 56

(iii) Mean marks = $\frac{\text{Sum of marks}}{\text{Total no.of students}}$ = $\frac{85 + 76 + 90 + 85 + 39 + 48 + 56 + 95 + 81 + 75}{10}$ = $\frac{730}{10}$ = 73

Thus, the mean marks obtained by a group of students are 73.

Q7. The enrollment in a school during six consecutive years as follows: - 1555, 1670, 1750, 2013, 2540, 2820Find the mean enrollment of the school for this period.

Difficulty Level: Easy

What is the given /known: Number of enrollments

What is unknown:

Mean

Reasoning:

Mean enrollment = $\frac{\text{sum of numbers of enrollments}}{\text{Total numbers of years}}$

Solution:

Total no. of years = 6 The enrollments in a school during six consecutive years = 1555, 1670, 1750, 2013, 2540, 2820

Mean enrollment = $\frac{\text{sum of numbers of enrollments}}{\text{Total numbers of years}}$ = $\frac{1555 + 1670 + 1750 + 2013 + 2540 + 2820}{6}$ = $\frac{12348}{6}$ = 2058 Thus, the mean enrollment of the school is 2058.



Q8. The rainfall (in mm) in a city on 7 days of a certain week as recorded as follows:

Day	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Rain fall (in mm)	0.0	12.2	2.1	0.0	20.5	5.5	1.0

(i) Find the range of the rainfall in the above data.

(ii) Find the mean rainfall of the week.

(iii) On how many days was the rainfall less than the mean rainfall?

Difficulty Level: Easy

What is the given /known: Rainfall in mm

What is unknown:

Range of the rainfall and mean rainfall

Reasoning:

Mean of the rainfall (in mm) = $\frac{\text{sum of rainfalls (in mm)}}{\text{Number of days}}$

Solution:

(i) Highest of the rainfall (in mm) = 20.5 Lowest of the rainfall (in mm) = 0.0

Range of the rainfall = Highest rainfall – Lowest rainfall = 20.5 - 0.0= 20.5 mm

(ii) Total number of days = 7 Record of the rainfall (in mm) = 0.0, 12.2, 2.1, 0.0, 20.5, 5.5, 1.0 Mean of the rainfall (in mm) = $\frac{\text{sum of rainfalls (in mm)}}{\text{Number of days}}$ = $\frac{0.0+12.2+2.1+0.0+20.5+5.5+1.0}{7}$ = $\frac{41.3}{7} = 5.9mm$

(iii) On 5 days rainfall was less than the mean rainfall i.e., Monday, Wednesday, Thursday, Saturday and Sunday.



Q9. The heights of the 10 girls were measured in cm and the results are as follows:

- 135, 150, 139, 128, 151, 132, 146, 149, 143, 141.
 - (i) What is the height of the tallest girl?
 - (ii) What is the height of the shortest girl?
- (iii) What is the range of the data?
- (iv) What is the mean height of the girls?
- (v) How many girls have height more than the mean height?

Difficulty Level: Easy

What is the given /known: Height of the 10 girls

What is unknown:

(i) Height of the tallest girl(ii) Height of the shortest girl(iii). Range of the data (iv) Mean height

Reasoning:

Range= Height of tallest girl – Height of the shortest girl

 $Mean = \frac{sum of all heights(in mm)}{mm}$

Number of girls

Solution: -

- (i) The height of the tallest girl =151 cm
- (ii) The height of the shortest girl = 128 cm
- (iii) Range of the data = Height of tallest girl Height of the shortest girl = 151 - 128= 23 cm
- (iv) Total number of girls =10 Measurement of the heights of 10 girls = 135, 150, 139, 128, 151, 132, 146, 149, 143, 141.

Mean height of the girls =
$$\frac{\text{sum of all heights (in mm)}}{\text{Number of girls}}$$

= $\frac{135 + 150 + 139 + 128 + 151 + 132 + 146 + 149 + 143 + 141}{10}$
= $\frac{1414}{10}$
= 14.14 cm

(v) Five girls have heights more than the mean height i.e.: 150, 151, 146, 149, 143.



Chapter- 3: Data Handling

Exercise 3.2 (Page 68 of Grade 7 NCERT)

Q1. The scores in mathematics test (out of 25) of 15 students are follows: 19, 25, 23, 20, 9, 20, 15, 10, 5, 16, 25, 20, 24, 12, 20. Find the mode and median of the data. Are they same?

Difficulty Level: Easy

What is the given /known: Scores in mathematics test of 15 students

What is unknown: The mode and median of the data

Reasoning:

Mode – Mode of a given data is that value of observation which occurs for the most number of times. Median = middle of observation (in this case, 8^{th} observation)

Solution: -

Scores of 15 students in mathematics test are: 19, 25, 23, 20, 9, 20, 15, 10, 5 16, 25, 20, 24, 12, 20. Arranging scores in ascending order, we get 5, 9, 10, 12, 15, 16, 19, 20, 20, 20, 20, 23, 24, 25, 25

Mode – Mode of a given data is that value of observation which occurs for the most number of times. Therefore, 20 occurs most of the time. \therefore Mode = 20.

Median = middle of observation (in this case, 8^{th} observation) \therefore Median = 20

Yes, mode and median of the given observations are same.

Q2. The runs scored in a cricket match by 11 Players are as follows: 6, 15, 120, 50, 100,80, 10,15, 8, 10, 15

Find the mean, median and mode of the data. Are they same? **Difficulty Level:**

Easy

What is the given /known: Runs scored in a cricket match by 11 Players



What is unknown: The mean, median and mode of the data

Reasoning: $Mean = \frac{Sum of all scores}{Total no. of players}$

Mode = Mode is the observation that occurs highest number of times

Median= Median is the middle observation

Solution: -

Total number of players = 11 Scores of players = 6, 15, 120, 50, 100,80, 10,15, 8, 10, 15 Mean = $\frac{\text{Sum of all scores}}{\text{Total no. of players}}$ = $\frac{6+8+10+15+15+15+50+80+100+120}{11}$ = $\frac{429}{11}$ = 39

Thus, mean = 39.

Arranging the scores into ascending order, we get 6, 8, 10,10, <u>15, 15, 15</u>, 50, 80, 100, 120

Mode is the observation that occurs highest number of times . Here, 15 occurs 3 times. ∴ Mode =15.

Median is the middle observation \therefore Median = 15 (6th observation)

Thus, Mean = 39, Mode= 15 and median = 15.

No, the mean, mode and median are not same.

Q3. The weights (in kg) of 15 students of a class are: 38, 42, 35, 37, 45, 50, 32, 43,43, 40, 36, 38, 43, 38,47 (i) Find the median and mode of this data. (ii) Is there more than one mode?

Difficulty Level: Easy

What is the given /known:

The weights (in kg) of 15 students of a class



The median and mode of this data.

Reasoning:

Mode = Mode is the observation that occurs highest number of times Median= Median is the middle observation

Solution: -

Total number of students =15 Weights of 15 students = 38, 42, 35, 37, 45, 50, 32, 43,43, 40, 36, 38, 43, 38, 47. Arranging in ascending order, we get 32, 35, 36,37,<u>38, 38,38,</u>40, 42, <u>43, 43,43</u>, 45, 47, 50

(i). Mode is the observation that occurred highest number of times. Thus, 38 and 43 occur highest number of times.
∴ Mode = 38 and 43. Also, median = 40 (8th observation)

(ii). Yes, there are two modes.

Q4. Find the mode and median of the data: 13, 16, 12, 14, 19, 12, 14, 13, 14.

Difficulty Level: Easy

What is the given /known: Given numbers

What is unknown: The mode and median of the data

Reasoning:

Mode = Mode is the observation that occurs highest number of times Median= Median is the middle observation

Solution: -

Given data = 13, 16, 12, 14, 19, 12, 14, 13, 14Arranging the data in ascending order, we get 12, 12, 13, 13, <u>14, 14, 14, 16, 19</u>.

 \therefore Mode is the observation that occurs highest number of times. \therefore Mode = 14

Also, median is the middle observation. \therefore Median = 14 (5th observation)



Q5. Tell whether the statement is true or false:

- (i) The mode is always one of the numbers in a data.
- (ii) The mean is one of the numbers in a data.
- (iii) The median is one of the numbers in a data.
- (iv) The data 6, 4, 3, 8, 9, 12, 13, 9, has mean 9.

Difficulty Level: Easy

Solution:

- (i) **True**: Mode is the observations that occurs highest numbers of times. Therefore, it is one observation in a data.
- (ii) **False**: Mean may or may not be one of the numbers in a data.
- (iii) **True**: Median is the middle observations of the given data when it is arranged in ascending or descending order.
- (iv) **False**: The given data 6, 4, 3, 8, 9, 12, 13, 9.

Mean = $\frac{6+4+3+8+9+12+13+9}{8}$ = $\frac{64}{8}$

Therefore, mean is 8.



Chapter- 3: Data Handling

Exercise 3.3

- **Q1**. Use the bar graph (fig 3.3) to answers the following questions.
 - (i) Which is the most popular pet?
 - (ii) How many students have dog as a pet?



Difficulty Level: Easy

Solution: -

From the given bar graph in figure, we have

- (i) Cats are the most popular pet among the students.
- (ii) 8 students have dog as a pet animal.



Q2. Use the bar graph (fig 3.4) which shows the no. of books sold by a bookstore during 5 consecutive years and answer the following questions:

- (i) About how many books were sold in 1989, 1990, & 1992?
- (ii) In which year about 475 books sold? About 225 books sold?
- (iii) In which years were fewer than 250 books sold?
- (iv) Can you explain how you would estimate the number of books sold in 1989?



What is the given /known:

Number of books sold during five consecutive years.

Reasoning:

We can answer all the question by observing the bar graph.

Solution: -

From the given bar graph, we have

- (i) In 1989, 180 books were sold.
 In 1990, 475 books were sold.
 In 1992, 225 books were sold.
- (ii) In 1990 about 475 books were sold and in 1992, 225 books were sold.
- (iii) In 1989 and 1992 fewer than 250 books were sold.
- (iv) From the graph, we can conclude that 180 books were sold in 1989.



Q3. Number of children in six different classes is given below. Represent the data on a bar graph.

Class	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
Number of Children	135	120	95	100	90	80

- a) How would you choose a scale?
- b) Answer the following questions:
 - (i) Which class has the maximum number of children? And minimum?
 - (ii) Find the ratio of students of class sixth to the students of class eight?

Difficulty Level: Easy

What is the given /known:

Number of children in different classes.

Reasoning:

We have to draw the graph by using the data.



a) Scale on y -axis is 1 unit = 10 children

b)

- (i) Fifth class has maximum number of children i.e. 135 Tenth class has the minimum number of children i.e. 80 Number of students in class sixth = 120
- (ii) Number of students in class eighth = 100



(iii)

Ratio =
$$\frac{\text{Number of students in class sixth}}{\text{Number of students in class eighth}}$$

= $\frac{120}{100}$
= $\frac{6}{5}$
= 6:5

Q4. The performance of a student in 1st term and 2nd terms is given. Draw a double bar graph choosing appropriate scale and answer the following:

Subject	English	Hindi	Maths	Science	S. Science
1st Term (M.M. 100)	67	72	88	81	73
2nd Term (M.M. 100)	70	65	95	85	75

- (i) In which subject, has the child improved his performance the most?
- (ii) In which subject improvement is the least?
- (iii) Has the performance gone down in any subject?

Difficulty Level: Easy

What is the given /known:

Marks obtained in different subject

Reasoning:

We have to draw the graph by using the data.





Difference between the marks of 1st and 2nd term

English = 70 - 67 = 3Hindi = 65 - 72 = -7 (Decrease in marks) Math = 95 - 88 = 7Science = 85 - 81 = 4Social Science = 75 - 73 = 2

- (i) In Math, the performance of the students improved the most.
- (ii) In Social science, the performance of the students improved the least.
- (iii) Yes, in Hindi the performance of the students has gone down.

Q5. Consider this data collected from a survey of a colony.

Favourite Sport	Cricket	Basketball	Swimming	Hockey	Athletics
Watching	1240	470	510	430	250
Participating	620	320	320	250	105

- (i) Draw a double bar graph choosing an appropriate scale. What do you infer from the bar graph?
- (ii) Which sport is most popular?
- (iii) Which is more preferred, watching or participating in the sports?

Difficulty Level: Easy

Reasoning:

We have to draw the graph by using the data.

Solution: -



- (i) This bar graph shows the number of persons who are watching and participating in their favorite sports.
- (ii) Cricket is the most popular sport.
- (iii) Watching different sports is more preferred than participating in the sports.



- **Q 6**. Take the data giving the maximum and minimum temperatures of various cities given in the beginning of this chapter (Table 3.1). Draw a double bar graph using the data and answer the following.
 - (i) Which city has the highest difference in the minimum and maximum temperature on the given date?
 - (ii) Which is the hottest city and which is the coldest city?
 - (iii) Name two cities where maximum temperature of one was less than the minimum temperature of the other.
 - (iv) Name the city which has the least difference between its minimum and maximum temperature?



Difficulty Level: Easy

Temperature of cities as on 20.06.2006

City	Maximum	Minimum
Ahmedabad	38° c	29° c
Amritsar	37°c	26° c
Bangalore	28° c	21° c
Chennai	36° c	27° c
Delhi	38° c	28° c
Jaipur	39° с	29° c
Jammu	41° c	26° c
Mumbai	32° c	27° c



Difference between the maximum and minimum temperature on 20.06.2006

Ahmedabad = $(38^{\circ}c - 29^{\circ}c) = 9^{\circ}c$ Amritsar = $(37^{\circ}c - 26^{\circ}c) = 9^{\circ}c$ Bangalore = $(28^{\circ}c - 21^{\circ}c) = 7^{\circ}c$ Chennai = $(36^{\circ}c - 27^{\circ}c) = 9^{\circ}c$ Delhi = $(38^{\circ}c - 28^{\circ}c) = 10^{\circ}c$ Jaipur = $(39^{\circ}c - 29^{\circ}c) = 10^{\circ}c$ Jammu = $(41^{\circ}c - 26^{\circ}c) = 15^{\circ}c$ Mumbai = $(32^{\circ}c - 27^{\circ}c) = 5^{\circ}c$

- (i) As, it is clear from the above calculation, Jammu has the largest difference in the minimum and maximum temperature on the given data i.e. 15°c.
- (ii) Jammu is the hottest city with 41° c and Bangalore is the coldest city with 21° c.
- (iii) Bangalore and Jaipur or Bangalore and Ahmedabad are the two cities where maximum temperature of one was less than the minimum temperature of other.
- (iv) Mumbai has the least difference between its minimum and maximum temperature. Maximum temperature = 32°c Minimum temperature = 27°c
 - \therefore Difference = $(32^{\circ}c 27^{\circ}c) = 5^{\circ}c$



Chapter- 3: Data Handling

Exercise 3.4

- **Q1**. Tell whether the following is certain to happen, impossible to happen, can happen but not certain.
- (i) You are older today than yesterday.
- (ii) A tossed coin will land heads up.
- (iii) A die when tossed shall land up with 8 on top.
- (iv) The next traffic light seen will be green.
- (v) Tomorrow will be a cloudy day.

Difficulty Level: Easy

Solution: -

- (i) Event: You are older today than yesterday.So, it is certain to happen.
- (ii) Event: A tossed coin will land heads up.Probability: when a coin is tossed, there are two chances of getting a {H}and{T}So, it can happen but not certain.
- (iii) Event: A die when tossed shall land up with 8 on top.Probability: When a dice is tossed, there are only six chances i.e. {1,2,3,4,5,6,}So, it is impossible.
- (iv) Event: The next traffic light seen will be green.

Probability: {red} {green}

So, it is certain to happen.

(v) Event: Tomorrow will be a cloudy day.

So, it is certain to happen.

- **Q2**. There are 6 marbles in a box with numbers from 1 to 6 marked on each of them.
 - (i) What is the probability of drawing a marble with number 2?
 - (ii) What is the probability of drawing a marble with number 5?

Difficulty Level: Easy



Solution: -

Given, Total number of marbles from 1 to 6 marked a box=6

 \therefore n(S)=6

(i). Number of marbles marked with 2 = 1

 \therefore n(E)=1

 $\therefore P \text{ (probability of drawing a marble)} = \frac{n(E)}{n(S)} = \frac{1}{6}$

(ii). Number of marbles marked with 5=1

$$n(E)=1$$

 \therefore P (probability of drawing a marble) =

$$\frac{n(E)}{n(S)} = \frac{1}{6}$$

Q3. A coin is flipped to decide which team starts the game. What is the probability that your team will start?

Difficulty Level: Easy

Solution: -

A coin has two possible outcomes Head {H} and Tail {T}. \therefore n(S)=2

As, Probability of coming head or tail is equal.

So, Number of successful events: n(E) = 1

 $\therefore P \text{ (starting game)} = \frac{n(E)}{n(S)} = \frac{1}{2}$



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