NCERT
Exercises (Questions-Solutions)

Exercise 3.1

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1. **Find the range of heights of any ten students of your class.**
Sol. Please try yourself.

2. **Organise 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) Find the arithmetic mean.

Sol.

4	6	7	5	3	5	4	5	2	6
2	5	1	9	6	5	8	4	6	7

(i) Highest number is 9.
(ii) Lowest number is 1.
(iii) Range of the data = Highest observation - Lowest observation = 9 – 1 = 8

(iv) $\text{Arithmetic mean} = \dfrac{\text{sum of all observations}}{\text{number of observations}}$

$$= \dfrac{\begin{matrix}4+6+7+5+3+5+4+5+2+6\\+2+5+1+9+6+5+8+4+6+7\end{matrix}}{20} = \dfrac{100}{20} = 5$$

3. **Find the mean of first five whole numbers.**
Sol. First 5 whole numbers are 0, 1, 2, 3 and 4.

$\text{Their arthmetic mean} = \dfrac{\text{sum of all observaions}}{\text{number of observations}}$

$$= \dfrac{0+1+2+3+4}{5} = \dfrac{10}{5} = 2$$

4. **A cricketer scores the following runs in eight innings:**
58, 76, 40, 35, 46, 45, 0, 100. Find the mean score.
Sol. $\text{Mrans core} = \dfrac{\text{sum of all observaions}}{\text{number of observations}}$

$$= \dfrac{58+76+40+35+46+45+0+100}{8}$$

$$= \frac{400}{8} = 50$$

5. **Following table shows the points of each player scored in four games:**

Player	Game 1	Game 2	Game 3	Game 4
A	14	16	10	10
B	0	8	6	4
C	8	11	Did not 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 total points by 3 or by 4? Why?
(iii) B played in all the four games. How would you find the mean?
(iv) Who is the best performer?

Sol. (i) $\text{Mean} = \dfrac{\text{sum of all observations}}{\text{number of obsesvations}}$

$$= \frac{14+16+10+10}{4} = \frac{50}{4} = 12.5$$

So, A's average number of points scored per game is 12.5.

(ii) To find the mean number of points per game for C, we shall divide the total points by 3 because the number of games under consideration is 4 but 'C' did not play game 3.

(iii) $\text{Mean} = \dfrac{\text{sum of all observations}}{\text{number of obsesvations}}$

$$= \frac{0+8+6+4}{4} = \frac{18}{4} = 4.5$$

(iv) C's average number of points scored per game

$$= \frac{\text{sum of all observations}}{\text{number of observations}}$$

$$= \frac{8+11+13}{3} = \frac{32}{3} = 10.6$$

[∵ 'C' did not play Game 3]

So, the best performer is A.

6. **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 and 75. Find the:**
   (i) Highest and the lowest marks obtained by the students.
   (ii) Range of the marks obtained.
   (iii) Mean marks obtained by the group.

Sol. (i) Highest marks obtained by the students $= 95$

Lowest marks obtained by the students $= 39$

(ii) Range of the marks obtained

= Highest marks - Lowest marks

$= 95 - 39 = 56$

(iii) Mean marks obtained by the group

$$= \frac{\text{sum of all observations}}{\text{number o fobservations}}$$

$$= \frac{85+76+90+85+39+48+56+95+81+75}{10}$$

$$= \frac{730}{10} = 73$$

7. **The enrolment of a school during six consecutive years was as follows:**
1555, 1670, 1750, 2013, 2540, 2820.
Find the mean enrolment of the school for this period.

Sol. Mean enrolment of the school for this period.

$$= \frac{\text{sum of all observaions}}{\text{number of obsesrvations}}$$

$$= \frac{1555+1670+1750+2013+2540+2820}{6}$$

$$= \frac{12348}{6} = 2058$$

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

Day	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Rainfall (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 for the week.
(iii) On how many days was the rainfall less than the mean rainfall.

Sol. (i) Range of the rainfall
= Highest rainfall – Lowest rainfall
$= 20.5 \text{ mm} - 0.0 \text{ mm} = 20.5 \text{ mm}$
(ii) Mean rainfall for the week

$$= \frac{\text{sum of all observations}}{\text{number of observaion}}$$

$$= \frac{0.0+12.2+2.1+0.0+20.5+5.5+1.0}{7}$$

$$= \frac{41.3}{7} = 5.9\text{mm}$$

(iii) The rainfall was less than the mean rainfall on 5 days.

9. **The heights of 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 heights more than the mean height?

Sol. (i) Height of the tallest girl = 151 cm

(ii) Height of the shortest girl = 128 cm

(iii) Range of the data = Highest observation - Lowest observation

$=151 \text{cm} - 128 \text{cm} = 23$ cm

(iv) Mean height of the girls $= \dfrac{\text{sum of all observations}}{\text{number of observataions}}$

$$= \dfrac{\begin{array}{c}135 + 150 + 139 + 128 + 151 \\ + 132 + 146 + 149 + 143 + 141\end{array}}{10} = \dfrac{1414}{10} = 141.4 \text{ cm}$$

(v) 5 girls have heights more than the mean height.

Exercise 3.2

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

Sol. **For Median.** We arrange the data in ascending order, we get

5, 9, 10, 12, 15, 16, 19, 20, 20, 20, 20, 23, 24, 25, 25

Median is the middle observation.

Therefore, 20 is the median.

For Mode. Mode = Observation with highest frequency = 20

Yes! they are same.

2. **The runs scored in a cricket match by 11 players is as follows:**
6, 15, 120, 50, 100, 80, 10, 15, 8, 10, 15.
Find the mean, mode and median of this data. Are the three same?

Sol. (i) **For Mean**

$$\text{Mean} = \dfrac{\text{sum of all observations}}{\text{number of observations}}$$

$$= \dfrac{\begin{array}{c}6 + 15 + 120 + 50 + 100 + 80 + 10 + \\ 15 + 8 + 10 + 15\end{array}}{11}$$

$$= \dfrac{429}{11} = 39$$

(ii) **For Median.** We arrange the data in ascending order, we get

6, 8, 10, 10, 15, 15, 15, 50, 80, 100, 120

Median is the middle observation. Therefore, 15 is the median.

(iii) **For Mode.** Mode = observation with highest frequency = 15

No ! They are not the same.

3. **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 mode and median of this data.
(ii) Is there more than one mode?

Sol. (i) **For Median.** We arrange the data in ascending order, we get

32, 35, 36, 37, 38, 38, 38, 40, 42, 43, 43, 43, 45, 47, 50

Median is the middle observation.
Therefore, 40 kg is the median.
For Mode. Mode = observation with highest frequency
= 38 kg and 43 kg.
(ii) Yes! there are 2 (more than one) modes.

4. **Find the mode and median of the data:**
13, 16, 12, 14, 19, 12, 14, 13, 14
Sol. **For Median.** We arrange the data in ascending order, we get 12, 12, 13, 13, 14, 14, 14, 16, 19.
Median is the middle observation.
Therefore, 14 is the median.
For Mode. Mode = observation with highest frequency = 14.

5. **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 always one of the numbers in a data.
(iv) The data 6, 4, 3, 8, 9, 12, 13, 9 has mean 9.
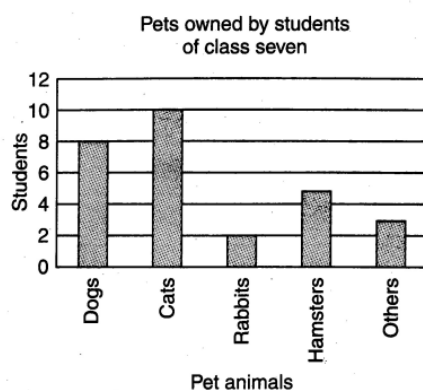**Sol.** (i) True   (ii) True
(iii) False   (iv) False.

Exercise 3.3

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**1.** **Use the bar graph to answer the following questions.**
(a) Which is the most popular pet?
(b) How many children have dog as a pet?

Pets owned by students of class seven

Sol. (a) The most popular pet is 'Cat'.
(b) 8 children have a dog as a pet.

2. **Read the bar graph which shows the number of books sold by a bookstore during five consecutive years and answer the following questions:**

Scale : 1 cm = 100 books
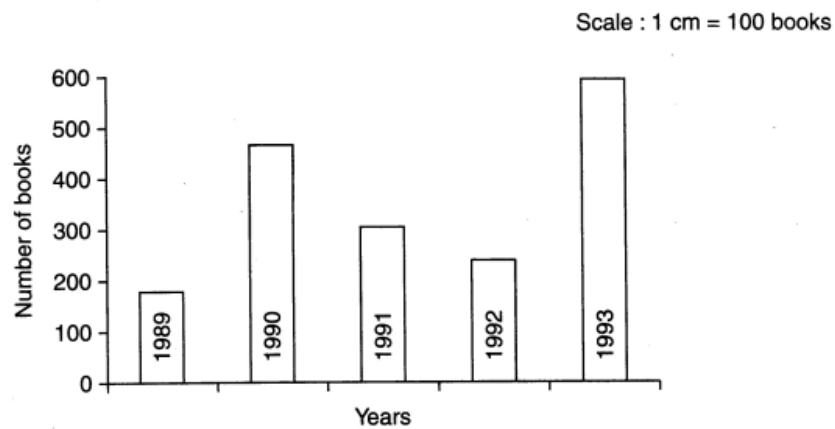
(i) About how many books were sold in 1989? 1990? 1992?
(ii) In which year were about 475 books sold? About 225 books sold?
(iii) In which years were fewer than 250 books sold?
(iv) Can you explain how you would estimate the number of books sold in 1989?

Sol.   (i) Number of books sold in 1989 = 175 (approx.)
Number of books sold in 1990 = 475 (approx.)
Number of books sold in 1992 = 225 (approx.)
(ii) About 475 were sold in the year 1990. About 225 books were sold in the year 1992.
(iii) Fewer than 250 books were sold in the years 1989 and 1992.
(iv) Length of the bar corresponding to 1989 is about 1.75 cm. The scale is 1 cm = 100 books. So, the number of books estimated to be sold in $1989 = 1.75 \times 100 = 175$.

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

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

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

Sol.

Scale : 1 unit = 10 children

Number of children in six different classes
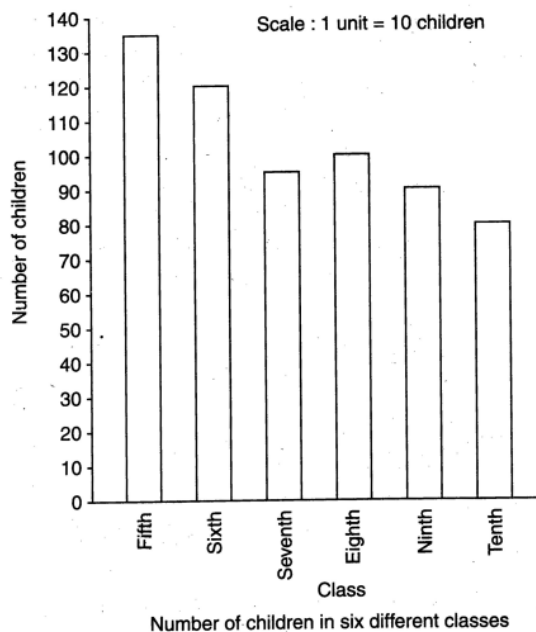
(a) Start the scale at 0. The greatest value in the data is 135, so end the scale at a value greater than 135, such as 140. Use equal divisions along the axes, such as increments of 10. We know that all the bars would lie between 0 and 140. We choose the scale such that the length between 0 and 140 is neither too long nor too small. Here, we take 1 unit for 10 children.

(b) (i) Fifth class has the maximum number of children. Tenth class has the minimum number 'of children.

(ii) Ratio of students of class sixth to eighth $= 120:100 = \dfrac{12}{100} = \dfrac{6}{5} = 6:5$

4. **The performance of a student in 1ˢᵗ Term and 2ⁿᵈ Term is given. Draw a double bar graph choosing appropriate scale and answer the following:**
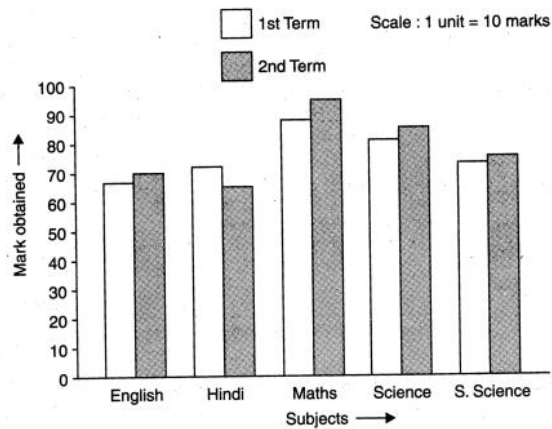
Subject	1ˢᵗ Term (M.M. 100)	2ⁿᵈ Term (M.M. 100)
English	67	70
Hindi	72	65
Maths	88	95
Science	81	85
So. Science	73	75

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

**Sol.**

The performance of students in 1st Term and 2nd Term

(i) The child improved his performance the most in the subject of Maths.

(ii) The improvement is the least in the subject of So. Science.

(iii) Yes! The performance has gone down in the subject of Hindi.

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

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

(i) Draw a double graph choosing an appropriate scale. What do you infer from the bar graph?

(ii) Which sport is most popular?

(iii) Which is more preferred, or participating in sports?

Sol.

Survey of a colony regarding favourite sport
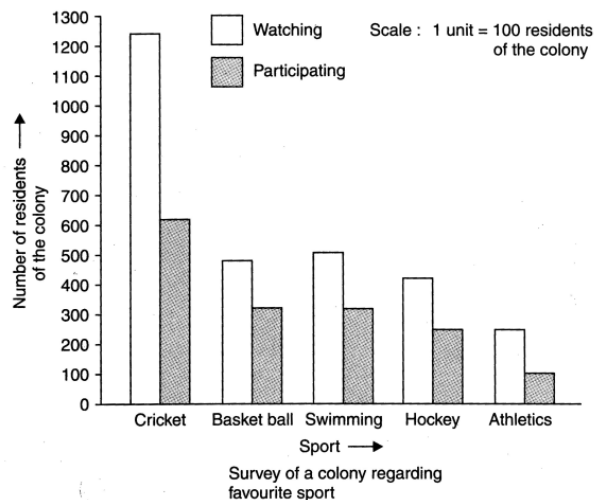
(i) We infer from the bar graph that the residents of the colony like cricket, the most and athletics, the least.

(ii) Cricket is most popular.

(iii) Watching is preferred more than participating.

6.   Take the data giving the minimum and the maximum temperature of various cities given in the beginning of this chapter. Plot a double bar graph using the data and answer the following:

(i) Which city has the largest 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 the maximum temperature.

Sol.
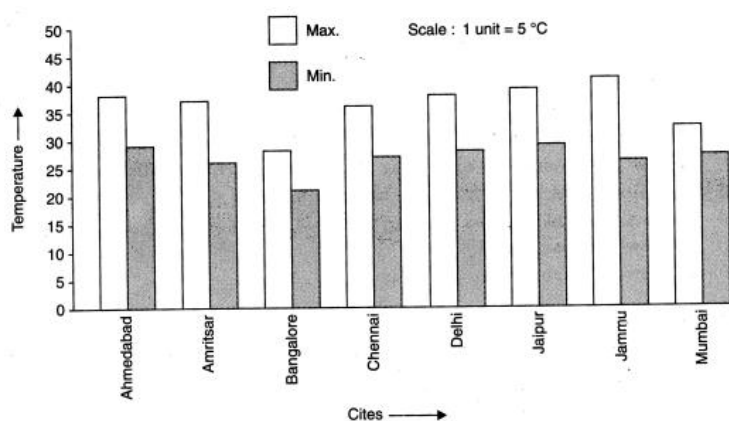
(i)

City	Difference in the minimum and maximum temperature on 20.06.2006
Ahmedabad	$38°C - 29°C = 9°C$
Amritsar	$37°C - 26°C = 11°C$
Bangalore	$28°C - 21°C = 7°C$
Chennai	$36°C - 27°C = 9°C$
Delhi ,	$38°C - 28°C = 10°C$
Jaipur	$39°C - 29°C = 10°C$
Jammu	$41°C - 26°C = 15°C$
Mumbai	$32°C - 27°C = 5°C$

Jammu has the largest difference in the minimum and maximum temperatures on the given date.
(ii) Jammu is the hottest city and Bangalore is the coldest city.
(iii) Bangalore and Ahmedabad
(iv) Mumbai.

Exercise 3.4

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1. **Tell whether the following is certain to happen, impossible, 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.
Sol. (i) It is certain to happen

(ii) It can happen but not certain
(iii) It is impossible
(iv) It can happen but not certain
(v) It can happen but not certain.

2. **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?

Sol. (i) $\dfrac{1}{6}$ (ii) $\dfrac{1}{6}$

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

Sol. Probability $= \dfrac{1}{2}$