Statistics

Science of collection presentation , analysis and interpretation of numerical data

Range

Difference of the largest and the smallest observation
eg : 15, 33, 24, 47, 91, 82
range = 91 – 15 = 76

Frequency — Number of times an observation occurs in
eg : 3,5,4,9,9,19 , frequency of 9 is 3

Frequency Distribuation Table

Ungrouped

Number	Tally Marks	Frequency
1	II	2
2	II	4
3	IIII	2
4	𝍸 I	6
5	III	3
6	III	3

Grouped

Number	Tally Marks	Frequency
0-10	𝍸 I	6
10-20	𝍸 I	6
20-30	IIII	4
30-40	III	3
40-50	I	1

Raw Data /Crude data
Unorganised data
Each entry in row data is called observation

Array/arranged data
(organised data)

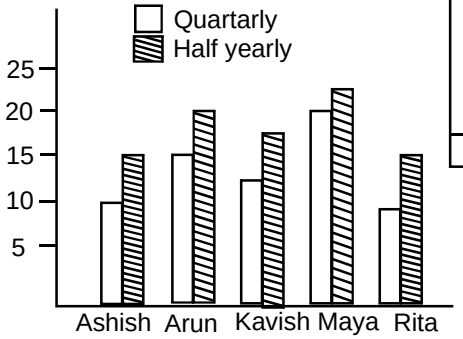
Measure of central tendency

Mean

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n} = \frac{\sum x_i}{n}$$

Mean of 3, 6, 9, 12, 15

$$\bar{x} = \frac{3 + 6 + 9 + 12 + 15}{5} \qquad \bar{x} = 9$$



Students	Ashish	Arun	Kavish	Maya	Rita
Quartely	10	15	12	20	9
Half yearly	15	18	16	21	15

$$\bar{x} = \frac{\sum fx}{\sum f}$$

x_i	f	f × x
25	5	125
27	4	108
28	5	140
30	6	180
32	3	96
33	2	66
sun	$\sum f = 25$	$\sum fx = 715$

Median

[divides the distribution into two equal parts] If n is number of observation

(i) When n is odd median

$= \left(\frac{n+1}{2}\right)^{th}$ observation.

3,1,4,3,6,5,9,5,3
arreange in ascending order
1,2,3,3,4,5,5,6,9

median $= \left(\frac{n+1}{2}\right)^{th}$ observation

$= \left(\frac{9+1}{2}\right)^{th}$ observation $= 4$

(ii) n is even median $= \frac{\left(\frac{n}{2}\right)^{th} \text{ ob.} + \left(\frac{n}{2}+1\right)^{th} \text{ ob.}}{2}$

eg : 11, 10, 12, 9, 8, 16, 15, 14
arreange : 8, 9, 10, 11, 12, 14, 15,16

$$\text{Median} = \frac{\left(\frac{8}{2}\right)^{th} \text{ ob.} + \left(\frac{8}{2}+1\right)^{th} \text{ ob}}{2} = \frac{4^{th}\text{ob.} + 5^{th}\text{ob.}}{2} = \frac{11+12}{2} = 11.5$$

Mode

[The value which occurs the most or has highest frequency]

eg :

Number	7	10	11	12	13	17
Frequency	2	1	1	3	2	1

Mode = 12 [Highest frequency = 3]

Favourate Colour	Red	Green	Blue	Yellow	Orange
No. of Students	43	19	55	49	34