MEAN

⇒ The common average of many individual values is referred to as the arithmetic mean. This number is obtained by dividing the sum of the given number by their total number. This number is also known as average.

$$\bar{X} = \frac{\Sigma X}{N}$$

Where $\bar{X}$ = mean
Σ = sum of
X = individual quantities
N = total number of individual quantities.

Q – Calculate the arithmetic mean of the following data :- 16, 17, 18, 19, 20.

Solution :- $\quad \bar{X} = \frac{\Sigma X}{N}$

$$= \frac{16 + 17 + 18 + 19 + 20}{5}$$

$$= \frac{90}{5} = 18$$

⇒ Properties :-
(i) It indicates the central tendency of the frequency distribution.
(ii) It is changed on a change in any observation.

12 SUNDAY

Demerits :-
It cannot be calculated on less of any observation.

APRIL   2000
S M T W T F S S M T W T F S
              1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16 17 18 19 20 21 22
23 24 25 26 27 28 29 30

→ If the number of individual quantities is large :-

When obtained data includes large number of observations the data is grouped.

$$\overline{X} = \frac{\Sigma f x}{N}$$

Where, $\overline{X}$ = Mean, Σ = Sum of
f = frequency of individual observations having x
X = individual quantities.

EX:- Calculate the average age of the students of a class, if the individual age of the students is 10, 12, 14, 16, 20, 10, 11, 12, 11, 15, 16, 18, 20, 12, 15, 15, 18, 16, 20, 12, 15, 14, 18, and 20 years.

Solution :-

X	f	f·X
10	2	20
11	2	22
12	4	48
14	2	28
15	4	60
16	3	48
18	3	54
20	4	80
$N = \Sigma f = 24$		$\Sigma fx = 360$

$$\overline{X} = \frac{\Sigma f x}{N}$$

$$= \frac{360}{24} = 15 \text{ years.}$$

→ If data observed is in group :-

For the value of X in grouped data, midpoint is calculated by dividing the sum of two extremes of the classes by two. ~~and the~~

$$\bar{X} = \frac{\sum fX}{N}$$

Example :- The length of students in a class is found to be as follows :-

Length	Number of Students
30 – 32"	5
33 – 35"	6
36 – 38"	8
39 – 41"	9
42 – 44"	10
45 – 47"	11

Solution :-

Class intervals	Midpoint X	f	f.X
30 – 32	31	5	155
33 – 35	34	6	204
36 – 38	37	8	296
39 – 41	40	9	360
42 – 44	43	10	430
45 – 47	46	11	506
		N = Σf = 49	Σfx = 1951

$$\bar{X} = \frac{\sum fX}{N} = \frac{1951}{49} = 39.81"$$