Arithmetic Mean :

* Arithmetic Mean is the most used measures of averages so it is also called as average.

* The Arithmetic Mean is denoted by $\bar{x}$ and it is defined by

(i) $\bar{x} = \dfrac{\sum_{i=1}^{n} x_i}{n}$, for individual observation.

(ii) $\bar{x} = A + \dfrac{\sum fd}{\sum f}$, for frequency distribution, where $d = \dfrac{x - A}{}$.

x = mid value of the class interval

A = Assumed value

n = number of observation

(iii) Combined mean of two groups is given by

$$\bar{x} = \frac{n_1\bar{x}_1 + n_2\bar{x}_2}{n_1 + n_2}$$

where $\bar{x}$ = combined mean

$\bar{x}_1$ = mean of first group

$\bar{x}_2$ = mean of second group

n_1 = number of items in the first group.

n_2 = number of items in the second group.

1) The following table gives the marks obtained by 10 students in a class. Calculate the arithmetic mean.

Roll No.	1	2	3	4	5	6	7	8	9	10
Marks	40	50	30	60	70	80	40	50	60	90

Arithmetic Mean = $\frac{\Sigma x_i}{n}$

$= \frac{40 + 50 + 30 + \ldots\ldots + 90}{10}$

$= 570/10 = 57$

2) From the following table find the mean height.

Height (in inches)	60	61	62	63	64
No. of children	2	3	5	8	7

$A = 62$

x	f	$d = x - A = x - 62$	fd
60	2	-2	-4
61	3	-1	-3
62	5	0	0
63	8	1	8
64	7	2	14

$\Sigma f = 25$ $\Sigma fd = 15$

The Arithmetic Mean, $\bar{x} = A + \frac{\Sigma fd}{\Sigma f}$

$\bar{x} = 62 + \frac{15}{25}$

$= 62 + 0.6$

$= 62.6$

The Arithmetic Mean, $\bar{x} = 62.6$

(*) 3) Following is the age distribution of 100 persons in a street calculate the Arithmetic Mean.

Age group	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
No. of persons	5	10	25	30	20	10

$A = 35$

x	f	mid of x	$d = x - 35$	fd
0 - 10	5	5	-30	-150
10 - 20	10	15	-20	-200
20 - 30	25	25	-10	-250
30 - 40	30	35	0	0
40 - 50	20	45	10	200
50 - 60	10	55	20	200
	$\Sigma f = 100$			$\Sigma fd = -200$

The A.M, $\bar{x} = A + \frac{\Sigma fd}{\Sigma f}$

$= 35 - \frac{200}{100}$

$= 35 - 2$

$= 33$

The Arithmetic Mean, $\bar{x} = 33$