ARTHMETIC MEAN

AM FOR UNGROUPED DATA

Total value of set of observations divided by their total number of observations.

$$\overline{X} = \frac{X_1 + X_2 + \ldots\ldots X_n}{N}$$

$$\overline{X} = \frac{\sum_{i=1}^{n} X_i}{N}$$

STEP:

1. Add the total observations
2. Divide by the total number of observations.

Q. Monthly income of 10 employees are 14780, 15760, 26690, 27750, 24840, 24920, 16100, 17810, 27050, 26950. Find the average monthly income.

Ans.

$$\overline{X} = \frac{\sum X}{N}$$

$$\Rightarrow \frac{14780+15760+26690+27750+24840+24920+16100+17810+27050+26950}{10}$$

$$\Rightarrow \frac{222650}{10} = 22265.$$

Q2. Find the mean score of marks obtained by 15 students in statistics, 78, 29,45,89,62,59,52,77,70,83,69,50,35,88,44.

Q1. A large firm selling sports equipment is testing the effect of two advertising plans on sales over the last four months. Given the sales seen here, which advertising program seems to be producing the highest mean growth in monthly sales?

Month	Plan 1	Plan 2
Jan	1,657	4,735
Feb	1,998	5,012
March	2,267	5,479
April	3,432	5,589

AM FOR GROUPED DATA

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

Where,

X = Midpoint of the various class interval

f = frequency of each class

N = total frequency

STEPS:

1. Find the midpoint (X).
2. Find the product of frequency and midpoint. (fX).
3. Summate the frequency to find N ($N = \sum f$)
4. Summate the product of frequency and midpoint. ($\sum fX$)
5. Put the values in the formula

Q. The following table shows the numbers of firms enjoying various level of profit. Find the average level of profit.

Profits	200-400	400-600	600-800	800-1000	1000-1200	1200-1400	1400-1600
No of firms	500	300	280	120	100	80	20

Ans.

Profits	No. of firms (f)	X	fX
200-400	500	300	150000
400-600	300	500	150000
600-800	280	700	196000
800-1000	120	900	108000
1000-1200	100	1100	110000
1200-1400	80	1300	104000
1400-1600	20	1500	30000
	N = 1400		$\sum fX = 848000$

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

$$\Rightarrow \frac{848000}{1400}$$

$$\Rightarrow 605.71$$

Q1. find the arithmetic mean of marks from the following table

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	12	18	27	20	17	6

Q2. Calculate the arithmetic mean of the following distribution

Class interval	0-8	8-16	16-24	24-32	32-40	40-48
No. of students	8	7	16	24	17	6

Q. 20 persons working in a factory had an average weekly wage of Rs2350. It was discovered that one figure was misread as 1200 instead of 1500. Calculate the correct average wage.

Ans.

$\overline{X} = 2350$

N = 20

Wrong $X_1 = 1200$

Right $X_1 = 1500$

$$\overline{X} = \frac{\sum X}{N}$$

$$\Rightarrow \quad \sum X = N\overline{X}$$

$$\sum X = 20 * 2350$$
$$= 47000$$

Subtracting the wrong X_1 and adding the right X_1 from the total value of X.

$$\sum X = 47000 - 1200 + 1500$$
$$= 47300$$

Therefore, the correct total value of X is 47300

$\sum X = 47300$

$$\overline{X} = \frac{\sum X}{N}$$
$$= \frac{47300}{20}$$
$$= 2365$$

The correct average weekly wage is Rs 2365.

Q1. The daily average pocket money of 12 students is Rs60. One student's pocket money was misread as Rs210 instead of Rs120. Calculate the correct value of the daily average pocket money.

WEIGHTED ARTHMETIC MEAN.

$$\overline{X} = \frac{\sum XW}{\sum W}$$

X = variable

W = weight

STEP:

1. Find the product of X and W
2. Summate the product of XW
3. Summate W
4. Put the values in the formula

Q. A contractor employs males, females and children to work. Male worker gets Rs400/day, female worker gets Rs300/day and child worker

get Rs170/day. The weights are as 20,15 and 5 respectively. Find he weighted average.

Ans.

X	W	XW
400	20	8000
300	15	4500
170	5	850
	$\sum W = 35$	$\sum XW = 13350$

$$\overline{X} = \frac{\sum XW}{\sum W}$$

$$= \frac{13350}{35}$$

$$= 333.75$$

Q1. From the above question if the wages were changed to Rs 350, Rs 250 and Rs 200 for male, female and child workers respectively. With the same weights, find the weighted average mean.