What does "Statistical Mean" mean?

The statistical mean refers to the mean or average that is used to derive the central tendency of the data in question. It is determined by adding all the data points in a population and then dividing the total by the number of points. The resulting number is known as the mean or the average.

Simple Mean Method

Find the mean of the set of numbers below

$$3, 4, -1, 22, 14, 0, 9, 18, 7, 0, 1$$

Solution

The first step is to count how many numbers there are in the set, which we shall call **n**

$$n = 10$$

The next step is to add up **all** the numbers in the set

$$\text{sum} = 3 + 4 + -1 + 22 + 14 + 0 + 9 + 18 + 7 + 0 + 1$$

$$\text{sum} = 77$$

The last step is to find the actual mean by dividing the sum by n

$$\text{mean} = \frac{\text{sum}}{n}$$

$$\text{mean} = \frac{77}{10}$$

$$\text{mean} = 7.7$$

Direct Method

Weight (in Kgs)   67 70 72 73 75
Number of students 4   3   2   2   1

Find   the   average   weight.
Solution   :

Weight (in kg)x_i	Frequency (f_i)	$f_i x_i$
67	4	268
70	3	210
72	2	144
73	2	146
75	1	75
	N=Σf_i = 12	$\Sigma f_i x_i$ = 843

$$x = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{843}{12} = 70.25 \text{ kg}$$

Short Cut Method

Weight(in kg)	**67**	**70**	**72**	**73**	**75**
Number of students	**4**	**3**	**2**	**2**	**1**

Find   the   mean   by   using   short-cut   method.
Solution   :
Let the assumed mean = A = 72

Weight(in kg)	**No. of students (f_i)**	**$d_i = x_i - A$ = x_i - 72**	**$f_i d_i$**
67	**4**	**-5**	**- 20**
70	**3**	**-2**	**- 6**

72	2	0	2
73	2	1	2
75	1	3	3
	Σ fi = 12		Σfi di = -21

Σ fi = 12 , Σ fi di = -21 , A = 72

$\overline{x} = A + \dfrac{1}{N}\Sigma fi\, ui$

$\Rightarrow$ Mean = 72 + (-21) / 12 = 72 – 7 / 4

$\Rightarrow$ Mean = 70.25 kg.

Find the mean of the following frequency distribution :

Class interval	0-10	10-20	20-30	30-40	40-50
Number of workers (f)	7	10	15	8	10

Solution :

Class interval	Class mark (xi)	Frequency (fi)	di = xi - 25	fi di
0 - 10	5	7	-20	-140
10 - 20	15	10	-10	-100
20 - 30	25	15	0	0
30 - 40	35	8	10	80
40 - 50	45	10	20	200
		Σ fi = 50		40

A = 25; N = 50 and Σfi di = 40

$\overline{x} = A + h\left[\dfrac{1}{N}\Sigma fi\, ui\right]$

$\Rightarrow$ Mean $=$ 25 $+$ 40 $/$ 50

$\Rightarrow$ Mean $= 25.8$

Step - Deviation Method

Variate   5   10 15 20 25 30
Frequency   20 43 75 67 72 45

Solution:
Let the assumed mean be A $=$ 20 and h $=$ 5.

Variate (xi)	Frequency (fi)	Deviation= di = xi - 20	ui = (xi - 20)/ 5	fi ui
5	20	-15	-3	-60
10	43	-10	-2	-86
15	75	-5	-1	-75
20	67	0	0	0
25	72	5	1	72
30	45	10	2	90
	N = Σ fi = 322			-59

N $=$ 322, A $=$ 20 , h $=$ 5 and Σ fi ui $= -$ 59

$$\overline{x} = A + h\left[\frac{1}{N}\Sigma fi\, ui\right]$$

$\Rightarrow$ Mean $=$ 20 $+$ 5 ($-$ 59 $/$ 322)

$\Rightarrow$ Mean $=$ 20 $-$ 0.91

$\therefore$ Mean $= 19.09$

Find the mean of following frequency distribution:

Class interval	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Number of workers	7	10	15	8	10

Solution   :

Class intervals	Mid values (x_i)	Frequency (f_i)	$d_i = x_i - 25$	$u_i = (x_i - 25) / 10$	$f_i u_i$
0-10	5	7	-20	-2	-14
10-20	15	10	-10	-1	-10
20-30	25	15	0	0	0
30-40	35	8	10	1	8
40-50	45	10	20	2	20
		$N = \Sigma f_i = 50$			4

A = 25 , h = 10 , N = 50 and $\Sigma f_i u_i$ = 4

$$\overline{x} = A + h\left[\frac{1}{N}\Sigma f_i u_i\right]$$

$\Rightarrow$ Mean = 25 + 10 x (4 / 50)

$\Rightarrow$ Mean = 25 + 0.8

$\therefore$ Mean = 25.8