Computation of Mean

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The mean is the most commonly used measure of central tendency. Computation of the mean requires scores that are numerical values measured on an interval or ratio scale. In education by Mean means simply arithmetic mean. To find the arithmetic mean, add the values of all terms and then divide sum by the number of terms, the quotient is the arithmetic mean. There are three methods to find the mean :

Direct method: In individual series of observations $x_1, x_{2,\ldots} x_n$ the arithmetic mean is obtained by following formula.

$$A.M. = \frac{x_1 + x_2 + x_3 + x_4 \ldots\ldots\ldots\ldots x_{n-1} + x_n}{n}$$

Short-cut method: This method is used to make the calculations simpler.

Let A be any assumed mean (or any assumed number), *d* the deviation of the arithmetic mean, then we have

$$\boldsymbol{M} = A + \frac{\sum fd}{N} \qquad (d=(x-A))$$

Step deviation method: If in a frequency table the class intervals have equal width, say i than it is convenient to use the following formula.

$$\boldsymbol{M} = A + \frac{\sum fu}{N} \times i$$

where $u=(x-A)/i$,and i is length of the interval, A is the assumed mean.

Example 1. Compute the arithmetic mean of the following by direct and short -cut methods both:

Class	**20-30**	**30-40**	**40-50**	**50-60**	**60-70**
Frequency	**8**	**26**	**30**	**20**	**16**

Solution.

Class	Mid Value x	f	fx	d= x-A A=45	f d
20-30	25	8	200	-20	-160
30-40	35	26	910	-10	-260
40-50	45	30	1350	0	0
50-60	55	20	1100	10	200
6070	65	16	1040	20	320
Total		N=100	$\sum$ fx = 4600		$\sum$f d = 100

By direct method

$M = (\sum fx)/N$

$= 4600/100$

$= 46$

By short cut method.

Let assumed mean A= 45.

$M = A + (\sum fd)/N$

$= 45+100/100$

$= 46$

Example 2: Compute the mean of the following frequency distribution using step deviation method. :

Class	**0-11**	**11-22**	**22-33**	**33-44**	**44-55**	**55-66**
Frequency	**9**	**17**	**28**	**26**	**15**	**8**

Solution.

Class	Mid-Value	f	d=x-A (A=38.5)	u = (x-A)/i i=11	Fu
0-11	5.5	9	-33	-3	-27
11-22	16.5	17	-22	-2	-34
22-33	27.5	28	-11	-1	-28
33-44	38.5	26	0	0	0
44-55	49.5	15	11	1	15
55-66	60.5	8	22	2	16
Total		N=103			$\sum$fu = -58

Let the assumed mean A= 38.5, then

$M = A + i (\sum fu)/ N = 38.5 + 11(-58)/103$

$= 38.5 - 638/103$

$= 38.5 - 6.194$

$= 32.306$

The End