Study Materials
Class - B. Com Hons Sem IV
Sub Code – BCH 4.2
Topic – Mean – Short Cut Method

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Finding out mean through shortcut method

If the values of x and f are large, then the direct method is very tedious and time consuming. As there are big calculations and chance of making mistake in that. So to minimize the time and easy calculations there is another method as mean short cut method. In this method we take deviations from an arbitrary point.

$x_1, x_2, \ldots x_n$, are observations with respective frequencies $f_1, f_2, \ldots, f_n$.
Let deviation A take at any point, we have
$d_i = x_i - A$, where, i = 1,2,3,…, n.
$\Rightarrow f_i d_i = f_i (x_i - A)$; i = 1,2,3,…,n
So mean by this method is given by

$$\overline{x} = A + \frac{1}{N}\sum fi\, ui$$

Steps involved in finding the mean short cut method :
1) Prepare a frequency table.
2) Choose A and take deviations $d_i = x_i - A$ of the values of x_i.
3) Multiply $f_i d_i$ and find the sum of it.
4) Use the above formula and find the mean.

Some solved examples :
1) The following table shows the weights of 12 students :

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 (fi)**	**di = xi - A = xi - 72**	**fi di**
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

$$\overline{x} = A + \frac{1}{N}\sum fi\ ui$$

⇒ Mean = 72 + (-21) / 12 = 72 – 7 / 4
⇒ Mean = 70.25 kg.

Example 2 : 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
