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Calculation of Arithmetic mean  
(by short-cut method)

Age (in years) (Class interval) (C.I.)	No. of cases (Frequency) (f)	mid value (x)	Deviation (x-A) where A = 42	Product (fdx)
25-29	14	27	-15	-210
30-34	14	32	-10	-140
35-39	22	37	-5	-110
40-44	16	42	0	0
45-49	6	47	5	30
50-54	5	52	10	50
55-59	3	57	15	45
	$\Sigma f = 70$		$\Sigma dx = 0$	$\Sigma fdx = -185$

$$\therefore \text{mean}(X) = A + \frac{\Sigma fdx}{\Sigma f}$$

$$\Rightarrow 42 + \frac{(-185)}{70}$$

$$\Rightarrow 42 + (-2.64)$$

$$\Rightarrow 42 - 2.64$$

$$\Rightarrow 39.36$$

\(\therefore\) The mean age of the patients is 39.36 years.

⑤ Calculate the mean from the following table shows the age distribution of patients of malaria in a village during a particular month:

Age (in year)	25-29	30-34	35-39	40-44	45-49	50-54	55-59
No. of cases	4	14	22	16	6	5	3

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Q. Find the mean of 14, 3, 0, 4, 5, 6.

Sol.  $\text{Mean}(\bar{x}) = \frac{\text{Sum of observations (}\sum f_i)}{\text{No. of observations (}\sum f)}$

$$\Rightarrow \frac{14+3+0+4+5+6}{6}$$

$$\Rightarrow \frac{32}{6} = 5.3$$

$$\text{Mean}(\bar{x}) = 5.3$$

Q. Find the arithmetic mean of 20.35, 15.75, 16.5, 34.95, 25.75, 27.04.

Sol.  $\text{Mean}(\bar{x}) = \frac{\text{Sum of observations (}\sum f_i)}{\text{No. of observations (}\sum f)}$

$$\Rightarrow \frac{20.35 + 15.75 + 16.5 + 34.95 + 25.75 + 27.04}{6}$$

$$\Rightarrow \frac{140.34}{6}$$

$$\Rightarrow 23.39$$

$$\text{Mean}(\bar{x}) = 23.39$$

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3. Compute the arithmetic average of the following items:

Sol (i) 25, 0.405, 3.245, 0.0832

Sol  $\therefore \text{mean}(\bar{x}) = \frac{\text{sum of observations (}\sum f_n\text{)}}{\text{no. of observations (}\sum f\text{)}}$

$$\Rightarrow \frac{25 + 0.405 + 3.245 + 0.0832}{4}$$

$$\Rightarrow \frac{28.7332}{4}$$

$$\Rightarrow 7.18333$$

$$\therefore \text{Mean}(\bar{x}) = 7.18333$$

(ii) 25, 0.3005, 4.81, 0.1003

Sol  $\therefore \text{mean}(\bar{x}) = \frac{\text{Sum of observations (}\sum f_n\text{)}}{\text{no. of observations (}\sum f\text{)}}$

$$\Rightarrow \frac{30.2108}{4} \quad 25 + 0.3005 + 4.81 + 0.1003$$

$$\Rightarrow \frac{30.2108}{4} = 7.5527$$

$$\therefore \text{Mean}(\bar{x}) = 7.5527$$

14. The following are the 10 measured values of  $x$ : 20.6, 19.8, 21.1, 21.8, 21.7, 24.7, 21.4, 21.5, 21.2, 21.0. Find (i) the average of the first six measurements, (ii) the average of the last six measurements.

Sol (i) First six measurements = 20.6, 19.8, 21.1, 21.8, 21.7, 24.7

$$\therefore \text{mean} = \frac{\text{Sum of observations (}\sum f_i x_i\text{)}}{\text{No. of observations (}\sum f_i\text{)}}$$

$$\Rightarrow \frac{20.6 + 19.8 + 21.1 + 21.8 + 21.7 + 24.7}{6}$$

$$\Rightarrow \frac{129.7}{6} = 21.616$$

$$\therefore \text{mean } (\bar{x}) = 21.616$$

(ii) Last six measurements = 21.7, 24.7, 21.4, 21.5, 21.2, 21.0

$$\therefore \text{mean} = \frac{\text{Sum of observations (}\sum f_i x_i\text{)}}{\text{No. of observations (}\sum f_i\text{)}}$$

$$\Rightarrow \frac{21.7 + 24.7 + 21.4 + 21.5 + 21.2 + 21.0}{6}$$

$$\Rightarrow \frac{131.5}{6} = 21.916$$

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$$\therefore \text{mean } (\bar{x}) = 21.916$$

5. The following are the monthly salaries in Rupees of 12 families. Calculate the arithmetic mean:

S.No	Income	S.No	Income
1	280	7	80
2	180	8	94
3	96	9	100
4	98	10	75
5	104	11	600
6	75	12	200
Total			1982

$$\therefore \text{mean} = \frac{\text{Sum of observations (}\sum f_i)}{\text{no. of observations (}\sum f)}$$

$$\Rightarrow \frac{1982 - 280 + 180 + 96 + 98 + 104 + 75 + 80 + 94 + 100 + 75 + 600 + 200}{12}$$

$$\Rightarrow \frac{1982}{12} = 165.16$$

$$\therefore \text{mean } (\bar{x}) = 165.16$$