Statistics Ex 7.3 Q21

Answer :

The given series is an inclusive series. Firstly, make it an exclusive series.

Class Interval	Mid-Value(x_i)	Frequency(f_i)	$d_i = x_i - A = x_i - 57$	$u_i = \frac{d_i}{h} = \frac{d_i}{3}$	$f_i u_i$
49.5—52.5	51	15	−6	−2	−30
52.5—55.5	54	110	−3	−1	−110
55.5—58.5	57	135	0	0	0
58.5—61.5	60	115	3	1	115
61.5—64.5	63	25	6	2	50
		$\sum f_i = 400$			$\sum f_i u_i = 25$

Let the assumed mean be $A = 57$ and $h = 3$.

We know that mean, $\overline{X} = A + h\left(\frac{1}{N}\sum f_i u_i\right)$

Now, we have $N = \sum f_i = 400$, $\sum f_i u_i = 25$, $h = 3$ and $A = 57$.

Putting the values in the above formula, we have

$$\overline{X} = A + h\left(\frac{1}{N}\sum f_i u_i\right)$$

$$= 57 + 3\left(\frac{1}{400} \times (25)\right)$$

$$= 57 + \frac{75}{400}$$

$$= 57 + 0.187$$

$$= 57.187$$

Hence, the mean is approximately 57.19.

Statistics Ex 7.3 Q22

Answer :

Let the assumed mean a = 225 and h = 50.

Daily expenditure (in Rs)	f_i	x_i	$d_i = x_i - 225$	$u_i = \frac{d_i}{50}$	$f_i u_i$
100–150	4	125	– 100	– 2	– 8
150–200	5	175	– 50	– 1	– 5
200–250	12	225	0	0	0
250–300	2	275	50	1	2
300–350	2	325	100	2	4
Total	$\sum f_i = 25$				$\sum f_i u_i = -7$

Now,

$\sum f_i = 25$

$\sum f_i u_i = -7$

$$\text{Mean, } \bar{x} = a + \left(\frac{\sum f_i u_i}{\sum f_i}\right) \times h$$

$$= 225 + \left(\frac{-7}{25}\right) \times (50)$$

$$= 225 - 14$$

$$= 211$$

Therefore, mean daily expenditure on food is Rs 211.

********** END **********