



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

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

$$\begin{aligned}
 \bar{X} &= A + h \left(\frac{1}{N} \sum f_i u_i \right) \\
 &= 57 + 3 \left(\frac{1}{400} \times (25) \right) \\
 &= 57 + \frac{75}{400} \\
 &= 57 + 0.187 \\
 &= 57.187
 \end{aligned}$$

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,

$$\sum f_i = 25$$

$$\sum f_i u_i = - 7$$

$$\begin{aligned}\text{Mean, } \bar{x} &= a + \left(\frac{\sum f_i u_i}{\sum f_i} \right) \times h \\ &= 225 + \left(\frac{-7}{25} \right) \times (50) \\ &= 225 - 14 \\ &= 211\end{aligned}$$

Therefore, mean daily expenditure on food is Rs 211.

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