



Statistics Ex 7.3 Q23

Answer :

Let the assumed mean $A = 0.1$ and $h = 0.04$.

Concentration of SO_2 (in ppm):	Midvalue (x_i):	frequency (f_i)	$d_i = x_i - A = x_i - 0.10$	$u_i = \frac{1}{h}(d_i) = \frac{1}{0.04}(d_i)$	$f_i u_i$
0.00–0.04	0.02	4	–0.08	–2	–8
0.04–0.08	0.06	9	–0.04	–1	–9
0.08–0.12	0.10	9	0	0	0
0.12–0.16	0.14	2	0.04	1	2
0.16–0.20	0.18	4	0.08	2	8
0.20–0.24	0.22	2	0.12	3	6
		$\sum f_i = 30$			$\sum f_i u_i = -1$

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

Now, we have $N = \sum f_i = 30$, $\sum f_i u_i = -1$, $h = 0.04$ and $A = 0.10$.

Putting the values in the above formula, we have

$$\begin{aligned}
 \bar{X} &= A + h \left(\frac{1}{N} \sum f_i u_i \right) \\
 &= 0.10 + 0.04 \left[\frac{1}{30} \times (-1) \right] \\
 &= 0.10 - \frac{0.04}{30} \\
 &= 0.10 - 0.001 \\
 &= 0.099
 \end{aligned}$$

Hence, the mean concentration of SO_2 in the air is 0.099 ppm.

Statistics Ex 7.3 Q24

Answer :

Let the assume mean $A = 17$.

No. of days : (x_i):	No. of students (f_i):	$d_i = x_i - A = x_i - 17$	$f_i d_i$
0–6	11	–14	–154
6–10	10	–9	–90
10–14	7	–5	–35
14–20	4	0	0
20–28	4	7	28
28–38	3	16	48
38–40	1	22	22
	$\sum f_i = 40$		$\sum f_i d_i = -181$

We know that mean, $\bar{X} = A + \frac{1}{N} \sum f_i d_i$

Now, we have $N = \sum f_i = 40$, $\sum f_i d_i = -181$ and $A = 17$.

Putting the values in the above formula, we have

$$\begin{aligned}\bar{X} &= A + \frac{1}{N} \sum_{i=1}^n f_i d_i \\ &= 17 + \frac{1}{40} \times (-181) \\ &= 17 - \frac{181}{40} \\ &= 17 - 4.525 \\ &= 12.475\end{aligned}$$

Hence, the mean number of days a student was absent is 12.475.

***** END *****