Statistics Ex 7.3 Q23

Answer :

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

Concentration of SO_2 (in ppm):	Mid value (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, $\overline{X} = A + h\left(\frac{1}{N}\sum f_i u_i\right)$

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

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

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	3	11	−14	−154
6 – 10	8	10	−9	−90
10 – 14	12	7	−5	−35
14 – 20	17	4	0	0
20 – 28	24	4	7	28
28 – 38	33	3	16	48
38 – 40	39	1	22	22
		$\sum f_i = 40$		$\sum f_i d_i = -181$

We know that mean, $\overline{X} = A + \frac{1}{N}\sum_{i=1}^{n} f_i d_i$

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

$$\overline{X} = A + \frac{1}{N}\sum_{i=1}^{n} f_i d_i$$

$$= 17 + \frac{1}{40} \times (-181)$$

$$= 17 - \frac{181}{40}$$

$$= 17 - 4.525$$

$$= 12.475$$

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

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