



Statistics Ex 7.3 Q19

Answer :

Given: Mean = 18

Suppose the missing frequency is x .

Let the assumed mean $A = 18$ and $h = 2$.

Class	Mid value (x_i)	frequency (f_i)	$d_i = x_i - A$ $= x_i - 18$	$u_i = \frac{1}{h}(d_i)$ $= \frac{1}{2}(d_i)$	$f_i u_i$
11-13	12	7	-6	-3	-21
13-15	14	6	-4	-2	-12
15-17	16	9	-2	-1	-9
17-19	18	13	0	0	0
19-21	20	x	2	1	x
21-23	22	5	4	2	10
23-25	24	4	6	3	12
		$\sum f_i = 44 + x$			$\sum f_i u_i = x - 20$

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

Now, we have $\sum f_i = 44 + x$, $\sum f_i u_i = x - 20$, $h = 2$ and $A = 18$.

Putting the values in the above formula, we have

$$18 = 18 + 2 \left(\frac{x - 20}{x + 44} \right)$$

$$\Rightarrow 2 \left(\frac{x - 20}{x + 44} \right) = 0$$

$$\Rightarrow x - 20 = 0$$

$$\Rightarrow x = 20$$

Thus, the missing frequency is 20.

Statistics Ex 7.3 Q20

Answer :

Given: Mean = 27

Let the assumed mean $A = 25$ and $h = 10$.

Class	Mid value (x_i)	frequency (f_i)	$d_i = x_i - A$ $= x_i - 25$	$u_i = \frac{1}{h}(d_i)$ $= \frac{1}{10}(d_i)$	$f_i u_i$
0-10	5	8	-20	-2	-16
10-20	15	p	-10	-1	$-p$
20-30	25	12	0	0	0
30-40	35	13	10	1	13
40-50	45	10	20	2	20
		$\sum f_i = 43 + p$			$\sum f_i u_i = 17 - p$

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

Now, we have $\sum f_i = 43 + p$, $\sum f_i u_i = 17 - p$, $h = 10$ and $A = 25$

Putting the values in the above formula, we have

$$27 = 25 + 10 \left(\frac{1}{43 + p} \times (17 - p) \right)$$

$$\frac{2}{10} = \left(\frac{(17 - p)}{43 + p} \right)$$

$$43 + p = 85 - 5p$$

$$6p = 42$$

$$p = 7$$

Thus, the value of p is 7.

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