(193-173) WK 29

11 MONDAY • JULY

Section - 3

Q2

AM = 2

Range of expend in ₹ 100/month	2-4	4-6	6-8	8-10	10-12
No. of families	38	292	389	212	69

Range	f	x	$(x-A)$	$f(x-A)$	$(x-A)^2$	$f(x-A)^2$	$(x-A)^3$	$f(x-A)^3$	$(x-A)^4$	$f(x-A)^4$	C.F.
2-4	38	3	-4	-152	16	608	-64	-2432	256	9728	38
4-6	292	5	-2	-584	4	1168	-8	-2336	16	4672	330
6-8	389	7(M)	0	0	0	0	0	0	0	0	719
8-10	212	9	2	424	4	848	8	1696	16	3392	931
10-12	69	11	4	276	16	1104	64	4416	256	17664	1000
	$\Sigma f = 1000$			$\Sigma f(x-A) = -36$		$\Sigma f(x-A)^2 = 3728$		$\Sigma f(x-A)^3 = 1344$		$\Sigma f(x-A)^4 = 35456$	

(12) JULY • TUESDAY 12

$$u_1' = \frac{\Sigma f(x-A)}{\Sigma f} = \frac{-36}{1000} = -0.036$$

$$u_2' = \frac{\Sigma f(x-A)^2}{\Sigma f} = \frac{3728}{1000} = 3.728$$

$$u_3' = \frac{\Sigma f(x-A)^3}{\Sigma f} = \frac{1344}{1000} = 1.344, \quad u_4' = \frac{\Sigma f(x-A)^4}{\Sigma f} = \frac{35456}{1000} = 35.456$$

Central Moments are given by

$$\mu_1 = 0$$

$$\mu_2 = \mu_2' - \mu_1^2 = 3.728 - (-0.036)^2 = 3.7267$$

$$\mu_3 = \mu_3' - 3\mu_2'\mu_1' + 2\mu_1'^3$$

$$= 1.344 - 3(3.728)(-0.036) + 2(-0.036)^3 - 3(-0.036)^4$$

$$= 35.456 + 0.193536 + 0.028988 - 5.0398 \times 10^{-6}$$

$$\mu_3 = 35.6785$$

$$\beta_1 = \frac{\mu_3^2}{\mu_2^6}$$

$$\beta_1 = \frac{(1.7465)^2}{(3.7267)^3}$$

$\beta_1 = 0.0589$ (Positive)

(195-171) WK 29

13 WEDNESDAY • JULY

JUNE

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

$\beta_2 = \frac{\mu_4}{\mu_2^2} = \frac{35.6785}{(3.7267)^2}$

$\beta_2 = 2.569 \ (<3)$ i.e curve is platykurtic

Means of Karl Pearson's skewness is given by

$\text{Mean} = A + \frac{\sum f(x-A)}{\sum f}$

$= 7 + \frac{(-36)}{1000} = 6.964$

$\text{Median} = l + \frac{\frac{N}{2} - cf}{f} \cdot i = 6 + \frac{\frac{1000}{2} - 376}{389} \times 2$

$= 6 + 0.437 \times 2 = 6.874$

$S.D \Rightarrow \sqrt{\frac{\sum f(x-A)^2}{\sum f} - \left(\frac{\sum f(x-A)}{\sum f}\right)^2}$

$\sqrt{\frac{3728}{1000} - \left(\frac{-36}{1000}\right)^2}$

$\sqrt{3.728 - 0.001296} = \sqrt{3.726} = 1.930$

AUG

M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

WK 29 (196-170)

JULY • THURSDAY 14

Karl Pearson's coefficient of skewness $= \frac{3(\text{Mean} - \text{Median})}{SD}$

$S_K = \frac{3(6.964 - 6.874)}{1.930}$

$S_K = \frac{0.27}{1.930} = 0.1398$

Since $S_K > 0$

Distribution is positively skewed.