Aimel Hasan - i20 0203 - answers

Probability and statitics (National University of Computer and Emerging Sciences)

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NATIONAL UNIVERSITY OF COMPUTER & EMERGING SCIENCES

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DEGREE: BS-(AF)

SUBJECT: BUSINESS STATISTICS

SUBMITTED TO: Sir Khalil-Ur-Rehman

ASSIGNMENT NO: 3

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14th April, 2021
Wednesday

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ASSIGNMENT#3

Question #1

Class Bound	f	X	fX	Cumm. freq	Class Limit
25.5-31.5	21	28.5	598.5	21	26-31
31.5-37.5	10	34.5	345	31	32-37
37.5-43.5	1	40.5	40.5	32	38-43
43.5-49.5	4	46.5	186	36	44-49
49.5-55.5	4	52.5	210	40	50-55
55.5-61.5	2	58.5	117	42	56-61
	$\Sigma f = 42$		$\Sigma fX = 1497$		

a) Mean

$$\bar{X} = \frac{\Sigma fx}{\Sigma f} \rightarrow \frac{1497}{42} = 35.64$$

b) Median

$$\tilde{X} = lb + \frac{h}{f}\left(\frac{\Sigma f}{2} - c\right) \qquad \frac{\Sigma f}{2} \rightarrow \frac{42}{2} \rightarrow 21$$

$$25.5 + \frac{6}{21}(21 - 0) \Rightarrow 31.5$$

c) Q3

$$lb + \frac{h}{f}\left(\frac{3\Sigma f}{4} - c\right) \qquad \frac{3\Sigma f}{4} \rightarrow \frac{3(42)}{4} \Rightarrow 31.5$$

$$37.5 + \frac{6}{1}(31.5 - 31) \Rightarrow 40.5$$

d) D6

$$lb + \frac{h}{f}\left(\frac{6\Sigma f}{10} - c\right) \qquad \frac{6\Sigma f}{10} \rightarrow \frac{6(42)}{10} \Rightarrow 25.2$$

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$$31.5 + \frac{6}{10}\left(25.2 - 21\right) \Rightarrow 34.02$$

e) P_{88}

$$lb + \frac{h}{f}\left(\frac{88\Sigma f}{100} - c\right)$$

$$\frac{88\Sigma f}{100} \rightarrow \frac{88(42)}{100} \Rightarrow 36.96$$

$$\frac{49.5 + 6}{4}\left(36.96 - 36\right) \Rightarrow 50.94$$

f) Mode

$$\hat{x} = lb + \frac{fm - f_1}{(fm - f_1) + (fm - f_2)} \times h$$

$$\frac{25.5 + 21 - 0}{(21 - 0) + (21 - 10)} \times 6 = 29.438$$

g) G.M

X	f	log X	f log X
28.5	21	1.455	30.555
34.5	10	1.538	15.38
40.5	1	1.607	1.607
46.5	4	1.667	6.668
52.5	4	1.720	6.88
58.5	2	1.767	3.534
	= 42		= 64.624

$$\text{Antilog}\left(\frac{64.624}{42}\right) \rightarrow \text{Antilog}\ (1.539)$$

$$= 34.59.$$

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h) H·M

$$\frac{\Sigma f}{\Sigma(f/x)} \rightarrow \frac{42}{1.247} = 33.680$$

QUESTION #2

(Q#2 of Assignment had correct data so used it)

a) Mean

$$\frac{1946}{332} = 5.861$$

b) Median

$$\left(\frac{332+1}{2}\right)^{th} \text{ term} = 166.5 \quad \text{so } 6$$

c) Q_1

$$i\left(\frac{n+1}{4}\right)^{th}$$

$$\frac{n+1}{4} = \frac{332+1}{4} = 83.25 \text{ term}$$

so

$Q_1 = 3$

d) P_{73}

$$73\left(\frac{n+1}{100}\right)^{th} \rightarrow 73\left(\frac{332+1}{100}\right)^{th} = 243.09 \text{ term}$$

so

$P_{73} = 8$

e) Mode

2 as it is repeated 53 times in data & has highest frequency.

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f) G.M

X	log X	f log X	f
1	0	0	6
2	0.301	15.953	53
3	0.477	23.373	49
4	0.602	16.254	27
5	0.698	18.148	26
6	0.778	16.338	21
7	0.845	34.645	41
8	0.903	29.799	33
9	0.954	20.034	21
10	1	31	31
11	1.04	18.72	18
12	1.079	3.237	3
13	1.113	3.339	3
	$\Sigma \log X = 9.79$	$\Sigma f \log X = 230.882$	

$G.M = \text{Antilog}\left(\frac{230.882}{332}\right)$

$\text{Antilog}(0.695)$

$= 4.954$

g) H.M

$\frac{\Sigma f}{\Sigma(f/x)} \rightarrow \frac{332}{81.815} = 4.057$

QUESTION #3

10 numbers $\times$ 8 (mean) = 80

11 numbers $\times$ 9 (mean) = 99

Difference $\rightarrow$ 99 - 80 = 19

11th number is 19

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QUESTION # 4

$\bar{x}_b = 120.4$ lb
$\bar{x}_g = 116.7$ lb
$\bar{x}_t = 122.3$ lb

$\bar{x}_g = \frac{\Sigma X_g}{N} \rightarrow 116.7 = \frac{x}{37} \rightarrow \Sigma X_g = 4317.9$

$\bar{x}_b = \frac{\Sigma X_b}{N} \rightarrow 120.4 = \frac{x}{45} \rightarrow \Sigma X_b = 5418$

$\bar{x}_t = \frac{\Sigma X_t}{N} \rightarrow 122.3 = \frac{x}{6} \rightarrow \Sigma X_t = 733.8$

SO

$$\bar{x} = \frac{\Sigma X_g + \Sigma X_b + \Sigma X_t}{N_g + N_b + N_t}$$

$$\rightarrow \frac{4317.9 + 5418 + 733.8}{37 + 45 + 6}$$

$\Rightarrow$ 118.973 is mean of whole class including girls, boys and teachers.

QUESTION # 5

@ Mode

7 shoe size is model size as 56

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b) P_{38}

$$38\left(\frac{n+1}{100}\right)^{th} \rightarrow 38\left(\frac{214+1}{100}\right)^{th}$$

$\rightarrow 81.7^{th}$ term

so 7 shoe size

C.F	18	40	75	131	146	191	214
X	4	5	6	7	8	9	10

c) G.M

f	X	log X	f log X
18	4	0.602	10.836
22	5	0.698	15.356
35	6	0.778	27.23
56	7	0.845	47.32
15	8	0.903	13.545
45	9	0.954	42.93
23	10	1	23

$\Sigma f = 214$ $\Sigma f \log X = 180.217$

$$\text{Antilog}\left(\frac{180.217}{214}\right)$$

Antilog (0.842)

$\Rightarrow 6.95$

d) H.M

$$\frac{\Sigma f}{\Sigma(f/x)} \rightarrow \frac{214}{31.908} \Rightarrow 6.707$$

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