

---

**NAME JALAL KHAN**

**ID 14885**

**Assignment Basic statistics**

---

Q:1 Take 100<sup>①</sup> observations randomly and Construct the followings.

• Discrete group frequency Distribution table.

• Contentious Class Boundaries Table.

10, 8, 8, 5, 6, 3, 3, 3, 10, 1,  
20, 19, 19, 13, 12, 12, 12, 11, 17, 19  
30, 22, 22, 23, 27, 29, 30, 25, 25, 24  
33, 32, 34, 35, 35, 37, 39, 40, 39, 38  
50, 50, 50, 47, 47, 47, 43, 42, 41, 47  
59, 58, 57, 57, 57, 52, 53, 52, 52, 60  
70, 69, 68, 65, 65, 65, 62, 62, 62, 70  
80, 80, 80, 75, 75, 74, 73, 72, 71, 80.  
89, 87, 86, 88, 85, 84, 84, 82, 82, 90  
96, 95, 96, 95, 96, 100, 96, 98, 99, 98

$$\begin{aligned} \text{① Range} &= \text{Highest} - \text{Lowest} \\ &= 100 - 1 \\ &= 99 \end{aligned}$$

② Class interval keeping at 9.  
Frequency Distribution Table.

No. of observation (classes)	Frequency
10 - 10	10
11 - 20	10
21 - 30	10
31 - 40	10
41 - 50	10
51 - 60	10
61 - 70	10
71 - 80	10
81 - 90	10
90 - 100	10

Q2.

(3)

Find Averages of frequency the above mentioned distribution Table.

• Arithmetic Mean.

$$\text{Arithmetic Mean} = \frac{\text{Sum of all observation}}{\text{No. of observations}}$$

$$= \frac{5190}{100}$$

$$\text{Arithmetic Mean} = 51.9$$

• Geometric Mean

Classes	Class Boundaries	Mid values (xi)	Freq (fi)	log(xi)	fi x log(xi)
0-10	0.5-10.5	5	10	0.6989	6.989
11-20	10.5-20.5	15	10	1.1761	11.761
21-30	20.5-30.5	25	10	1.3979	13.979
31-40	30.5-40.5	35	10	1.544	15.44
41-50	40.5-50.5	45	10	1.653	16.53
51-60	50.5-60.5	55	10	1.74	17.4
61-70	60.5-70.5	65	10	1.813	18.13
71-80	70.5-80.5	75	10	1.875	18.75
81-90	80.5-90.5	85	10	1.929	19.29
91-100	90.5-100.5	95	10	1.9777	19.777
			$\Sigma fi = 100$		$\Sigma fi \times \log(xi) = 158.04$

• Contentious <sup>(4)</sup> Class Boundaries Table

Classes	Class Boundaries	Frequency
0 — 10	0.5 — 10.5	10
11 — 20	10.5 — 20.5	10
21 — 30	20.5 — 30.5	10
31 — 40	30.5 — 40.5	10
41 — 50	40.5 — 50.5	10
51 — 60	50.5 — 60.5	10
61 — 70	60.5 — 70.5	10
71 — 80	70.5 — 80.5	10
81 — 90	80.5 — 90.5	10
91 — 100	90.5 — 100.5	10



⑤  
Geometric Mean =  $\frac{1}{N} \sum_{i=1}^n f_i \log(x_i)$

$$= \frac{158.046}{100}$$

$$\text{Geometric Mean} = 1.58046$$

Harmonic Mean :

Node :

⑥

Node

is

96.

Q:3 Find <sup>(7)</sup> Quartiles of the Discrete Frequency Distribution table.

Classes	Frequency	CF
1-10	10	10
11-20	10	20
21-30	10	30
31-40	10	40
41-50	10	50
51-60	10	60
61-70	10	70
71-80	10	80
81-90	10	90
91-100	10	100

Q: 1  
 Class =  $\frac{N}{4}^{\text{th}}$   
 $= \frac{100}{4} = 25$   
 Class (21-30)



The lower <sup>(8)</sup> boundary of class

$$21-30 \quad 9.5 \quad 21$$

$$L = 21$$

$$Q_1 = L + \frac{\frac{n}{4} + CF}{f} \times C$$

$$Q_1 = 21 + \frac{25 - 30}{10} \times 9$$

$$= 21 + \frac{-5}{10}$$

$$= 21 + (-0.5 \times 9)$$

$$= 21 + (-4.5)$$

$$Q_1 = 16.5$$

Q 8 2

$$\text{Class} = \frac{2^{nd}}{4}$$

$$= \frac{2(100)}{4} = 50$$

$$\text{Class} = 41-50$$

Class ④ 41 - 50 lower limit 95  
41

$$Q_2 = L + \frac{\frac{2n}{4} - CF}{f} \times C$$

$$Q_2 = 41 + \frac{50 - 50}{10} \times 9$$

$$Q_2 = 41 + \frac{0}{10} \times 9$$

$$Q_2 = 41$$

Q<sub>3</sub>

$$\begin{aligned} \text{Class} &= \frac{3nt}{4} \\ &= \frac{3(100)}{4} \\ &= 75 \end{aligned}$$

Class = 71 - 80

Class 71-80 lower limit 71  
71

(10)

$$Q_3 = L + \frac{3^{\text{rd}} - CF}{CF} \times C$$

$$Q_3 = 71 + \frac{75 - 80}{10} \times 9$$

$$= 71 + \frac{-5}{1} \times 9$$

$$= 71 + (-0.5 \times 9)$$

$$= 71 + (-4.5)$$

$$= 71 - 4.5$$

$$Q_3 = 66.5$$

①-4 Find the following of  
the Discrete group frequency  
distribution table.

• Range

$$\begin{aligned}\text{Range} &= \text{Maximum} - \text{Minimum} \\ &= 100 - 1 \\ &= 99\end{aligned}$$

• Quartile Range

$$\begin{aligned}Q_3 - Q_1 \\ \text{interquartile Range} &= Q_3 - Q_1 \\ &= 66.5 - 41 \\ &= 25.5\end{aligned}$$

Semi-interquartile Range: (19)

$$= Q_3 - Q_1 / 2$$

$$= 66.5 - 41 / 2$$

$$= 25.5 / 2$$

Semi-inter  
quartile  
Range = 12.75

(13)

Variance :

Classes	Mid Point $\bar{X}_i$	Frequency	$(X - \bar{X}_i)^2$	$(X - \bar{X}_i)^2$
0-10	5	10	-45	2025
11-20	15	10	-35	1225
21-30	25	10	-25	625
31-40	35	10	-15	225
41-50	45	10	-5	25
51-60	55	10	5	25
61-70	65	10	15	225
71-80	75	10	25	625
81-90	85	10	35	1225
91-100	95	10	45	2025

$$\sum \bar{X}_i = 50$$

$$\sum (X - \bar{X}_i)^2 = 8250$$

$$\text{Variance} = \frac{\sum (X - \bar{X}_i)^2}{100}$$

$$= \frac{8250}{100}$$

$$\text{Variance} = 82.5$$



Standard Deviation: (14)

$$S.D = \sqrt{\text{Variance}}$$

$$S.D = \sqrt{82.5}$$

$$S.D = 9.08$$

Co-efficient of Variance

$$\begin{aligned} \text{Co-effecience of variance} &= S.D / \text{Mean} \times 100 \\ &= 9.08 / 50 \times 100 \\ &= 18.16 \% \end{aligned}$$