

NAME= JALIL -UR-REHMAN

ID= 14521

Subject = Basic statistics

Instructor = RAZA AHMED KHAN

Submission DATE: 20 September 2020.

Q.1 Take 100 observations randomly and construct the followings.

- Discrete group frequency Distribution table.
- Continuous classes Boundaries table.

10, 8, 8, 5, 6, 3, 2, 3, 10, 1, 20, 12, 19, 13, 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, 89  
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

① Range = Highest - Lowest

$$= 100 - 1$$

$$= 99$$

②

② Class interval keeping at 9.  
Frequency Distribution table.

No. of observation classes	Frequency
0-10	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
91-100	10

Q.2 Find Averages of the above mentioned frequency distribution table.

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

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

• 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
			$\sum fi = 100$	$\sum fi \log(xi) = 158.04$	

(4)

→ Contentious 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

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

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

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

Harmonic Mean:

Mode:

Mode is 96.

Q.3 Find Quartiles of the Discrete Frequency Distribution table

classes	Frequency	cf
1-10	10	10
11-20	10	20
20-30	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

Q1 class :  $\frac{N}{4}$   
 $= \frac{100}{4} = 25$   
class (~~21~~ - 30)

The lower boundary of class  
21-30 is 21

$$L = 21$$

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

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

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

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

$$= 21 + (-4.5)$$

$$Q_1 = 16.5 \text{ Ans.}$$

Q.2

$$\text{class} = \frac{2^{14}}{4}$$

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

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



②

class 41-50 lower limit is 41.

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

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

$$= 41 - \frac{0}{10} \times 9$$

$$Q_2 = 41 \text{ Ans}$$

Q.3

$$\text{class} = \frac{3^{th}}{4}$$

$$= \frac{3(100)}{4}$$

$$= 75$$

$$\text{class} = 71 - 80$$

class 71-80 lower limit  
is 71.

9

$$Q.3 \quad \frac{2 + \frac{3^n}{4} - CF \times C}{F}$$

$$Q.3 = \frac{71 + 75 - 80 \times 9}{10}$$

$$= 71 + \frac{-5}{10} \times 9$$

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

$$= 71 - 4.5$$

$$Q.3 = 66.5 \text{ Ans}$$

(10)

Q.4 Find the followings of the discrete group frequency distribution table.

• Range:-

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

Quartile Range

$$Q_3 - Q_1$$

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

Semi-interquartile Range:-

$$\begin{aligned}&= Q_3 - Q_2 / 2 \\ &= 66.5 - 41 / 2 \\ &= 12.75 \text{ Ans.}\end{aligned}$$

(11)

Variance =

Classes	Mid Point $x_i$	Freq	$(x - \bar{x}_1)$	$(x - \bar{x})^2$
0-10	5	10	-45	2025
11-21	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

$$\sum \bar{x}_1 = 5$$

$$\sum (x - \bar{x}_1)^2 = 8250$$

$$\text{Variance} = \frac{\sum (x - \bar{x}_1)^2}{100}$$

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

$$\text{Variance} = 82.5 \text{ Ans.}$$

②

• standard Deviation:

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

$$= \sqrt{82.5}$$

$$= 9.08 \text{ Ans.}$$

• Co-efficient of Variance.

Co-efficient of variance =

$$S.D / \text{Mean} \times 100$$

$$= 9.08 / 500 \times 100$$

$$= 18.16 \% \text{ Ans}$$