

Name : Basit Khan

ID : 7812

SEC : "A"

Teacher : Sir, Anwar Shamim

Subject : Prob & Statistics

Mid : Assignment

Ungrouped Frequency Distribution:

by scanning the data, we find that the number of children born is a discrete variable and the range is small, so that the data can be conveniently sorted by taking the values of class as 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, the frequency distribution is then constructed as:

Number of children born

0
1
2
3
4
5
6
7
8
9
10

Tally

1

Frequency

1
4
8
14
7
5
4
3
2
1
1

50

Median For group data

$$\text{Median} = l + \frac{h}{f} \left(\frac{n}{2} - c \right) \quad \text{--- (1)}$$

l = Lower class boundary

h = Class interval, f = frequency

(ii) Mode and MedianMode:

0, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3,
 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5,
 6, 6, 6, 6, 7, 7, 7, 8, 8, 9, 10

Mode = 3 appears 14 times more than the other values, So mode = 3

Median:

0, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3,
 3, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5,
 6, 6, 6, 6, 7, 7, 7, 8, 8, 9, 10

Even numbers

$$\frac{3+3}{2} = \frac{6}{2} = 3$$

So The Median is "3"

Q No: 02 :-

Classes	Class boundaries	Frequency 3 (F)	Cumulative Frequency 3 (C.F)
2 - 4	1 - 5		
6 - 8	5 - 9	13	16
10 - 12	9 - 13	6	22
14 - 16	13 - 17	10	32
18 - 20	17 - 21	5	37
22 - 24	21 - 25	3	40
26 - 28	25 - 29	5	45
30 - 32	29 - 33	3	48
34 - 36	33 - 37	2	50
		$\Sigma = 50$	

Quartiles:

$$Q_1 = \frac{n}{4} \Rightarrow \frac{50}{4} = 12.5$$

12.5 lies in 5-9 class boundary

$$\begin{aligned}
 Q_1 &= l + \frac{h}{f} \left(\frac{n}{4} - c \right) \\
 &= 5 + \frac{4}{13} \left(\frac{50}{4} - 3 \right) \\
 &= 5 + .30 (12.5 - 3) \\
 &= 7.85
 \end{aligned}$$

$$Q_2 = \frac{2n}{4} \Rightarrow \frac{2 \times 50}{4} = 25$$

25 lies in 13-17 class boundary

So

$$\begin{aligned} Q_2 &= l + \frac{h}{f} \left(\frac{2n}{4} - c \right) \\ &= 13 + \frac{4}{10} \left(\frac{2 \times 50}{4} - 22 \right) \\ &= 13 + \frac{4}{10} (25 - 22) \\ &= 13 + \frac{4}{10} (3) \\ &= 13 + 1.2 \end{aligned}$$

$$Q_2 = 14.2$$

$$Q_3 = \frac{3n}{4} \Rightarrow \frac{3 \times 50}{4} = 37.5$$

37.5 lies in 21-25 class boundary

So

$$Q_3 = l + \frac{h}{f} \left(\frac{3n}{4} - c \right)$$

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$$= 21 + \frac{4}{3} \left(\frac{3+50}{4} - 37 \right)$$

$$= 21 + \frac{4}{3} (37.5 - 37)$$

$$= 21 + \frac{4}{3} (0.5)$$

$$= 21 + 0.67$$

$$Q_3 = 21.67$$

Deciles:

$$D_1 = \frac{n}{10} \Rightarrow \frac{50}{10} = 5$$

5 lies in 5-9 class boundary

Hence

$$D_1 = l + \frac{h}{f} \left(\frac{n}{10} - c \right)$$

$$= 5 + \frac{4}{13} \left(\frac{50}{10} - 3 \right)$$

$$= 5 + \frac{4}{13} (5-3)$$

$$= 5 + \frac{4}{13} (2)$$

$$= 5 + 0.61$$

$$D_1 = 5.61$$

P-T-O →

$$D_2 = \frac{2n}{10} \Rightarrow \frac{2 \times 50}{10} = 10$$

10 Lies in 5-9

Hence

$$D_2 = l + \frac{h}{f} \left(\frac{2n}{10} - c \right)$$

$$D_2 = 5 + \frac{4}{13} \left(\frac{2 \times 50}{10} - 3 \right)$$

$$D_2 = 5 + \frac{4}{13} (10 - 3)$$

$$D_2 = 5 + \frac{4}{13} (7)$$

$$D_2 = 5 + 2.15$$

$$D_2 = 7.15$$

$$D_3 = \frac{3n}{10} \Rightarrow \frac{3 \times 50}{10} = 15$$

15 Lies in 5-9 class boundary

Hence,

$$D_3 = l + \frac{h}{f} \left(\frac{3n}{10} - c \right)$$

$$D_3 = 5 + \frac{4}{13} \left(\frac{3 \times 50}{10} - 3 \right)$$

$$D_3 = 5 + \frac{4}{13} (15 - 3)$$

$$D_3 = 5 + 0.307 (12)$$

$$D_3 = 5 + 3.69$$

$$D_3 = 8.69$$

$$D_4 = \frac{4n}{10} \Rightarrow \frac{4 \times 50}{10} = 20$$

20 lies in 9-13 class boundary

Hence $D_4 = l + \frac{h}{f} \left(\frac{4n}{10} - c \right)$

$$D_4 = 9 + \frac{4}{6} (20 - 16)$$

$$D_4 = 9 + \frac{4}{6} (4)$$

$$D_4 = 9 + 2.67$$

$$D_4 = 11.67$$

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$$D_5 = \frac{5n}{10} \Rightarrow \frac{5 \times 50}{10} = 25$$

25 lies in 13-17 class boundary

Hence
$$D_5 = l + \frac{h}{f} \left(\frac{5n}{10} - c \right)$$

$$D_5 = 13 + \frac{4}{10} \left(\frac{5 \times 50}{10} - 22 \right)$$

$$= 13 + \frac{4}{10} (25 - 22)$$

$$= 13 + \frac{4}{10} (3)$$

$$D_5 = 14.2$$

$$D_6 = \frac{6n}{10} \Rightarrow \frac{6 \times 50}{10} = 30$$

30 lies in 13-17 class boundary

Hence

$$D_6 = l + \frac{h}{f} \left(\frac{6n}{10} - c \right)$$

$$= 13 + \frac{4}{10} \left(\frac{6 \times 50}{10} - 22 \right)$$

$$= 13 + \frac{4}{10} (30 - 22)$$

$$13 + \frac{4}{10} (8)$$

$$\approx 13 + 3.2$$

$$D_6 = 16.2$$

$$D_7 = \frac{7n}{10} \Rightarrow \frac{7 \times 50}{10} = 35$$

35 lies in 17-21 class boundary

Hence,

$$D_7 = l + \frac{h}{f} \left(\frac{7n}{10} - c \right)$$

$$D_7 = 17 + \frac{4}{5} \left(\frac{7 \times 50}{10} - 32 \right)$$

$$= 17 + \frac{4}{5} (35 - 32)$$

$$= 17 + \frac{4}{5} (3)$$

$$= 17 + 2.4$$

$$D_7 = 19.4$$

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(11)

$$D_8 = \frac{8n}{10} \Rightarrow \frac{8 \times 50}{10} = 40$$

40 lies in 21-25 class boundary

Therefore,

$$D_8 = L + \frac{h}{f} \left(\frac{8n}{10} - c \right)$$
$$= 21 + \frac{4}{3} \left(\frac{8 \times 50}{10} - 37 \right)$$

$$= 21 + \frac{4}{3} (40 - 37)$$

$$= 21 + \frac{4}{3} (3)$$

$$= 21 + 4$$

$$D_8 = 25$$

Now

$$D_9 = \frac{9n}{10} \Rightarrow \frac{9 \times 50}{10} = 45$$

45 lies in 25-29 class boundary

Therefore,

$$D_9 = l + \frac{h}{f} \left(\frac{9n}{10} - c \right)$$

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12

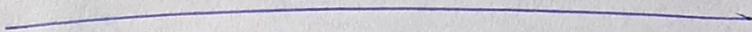
$$D_9 = 25 + \frac{4}{5} \left(\frac{9 \times 50}{10} - 40 \right)$$

$$D_9 = 25 + \frac{4}{5} (45 - 40)$$

$$D_9 = 25 + \frac{4}{5} (5)$$

$$D_9 = 25 + 4$$

$$D_9 = 29$$



Q.No: 03 Define the following

(a) Random Statistics:

In the common parlance, randomness is the apparent lack of pattern or predictability in events.

A random sequence of events, symbols or steps often has no order & does not follow an intelligible pattern or combination.

(b) Inferential Statistics:

Inferential Statistics is a branch of Statistics through which we collect the data, analyze the data, summarize the data, interpret the data and tabulate the data to get precise results in non-numerical form.

→ It is also defined as:

The process of reaching generalizations about the whole by examining a portion is called inferential statistics.

(C) Descriptive Statistics :-

The Collection of data analysis of data, Summarization of data, Interpretation of data, tabulation of data at Last we get a precise result in numerical form is called descriptive Statistics.

→ It is also define as :

Descriptive Statistics is Concerned with the Summarization and describing a body of data.

(d) Source of Primary data :-

The Source of primary data are usually Chosen and tailored specifically to meet the demands or requirements of a particular research. Also, before choosing a data Collection Source, things like the aim of the research and target population need to be identified

→ Following are the sources of primary data

- (i) Direct personal investigation
- (ii) Indirect investigation
- (iii) Interview method
- (iv) Collection through Enumerators

- (v) Questioner Method
- (vi) Collection Through Local Sources
- (vii) Computer interview Method.

(e) Nominal Scale:

It is define as :-

The Classification of the observation into mutually exclusive qualitative classes is said to be nominal Scale

e.g:-

- (a) Students are classified as male and female. We may use numbers 1 and 2
- (b) Rainfall may be classified as heavy, moderate and light.

we must use numbers 1, 2 and 3

The number when they are used, only identify the categories in this scale no particular order is used.

Q. No: 1

i) Grouped Frequency distribution:

By Scanning the data, we find that the largest number of baby born is '10' and the smallest number is '0' So that the range is :

$$\begin{aligned} \text{Range} &= \text{Largest value} - \text{Smallest value} \\ &= 10 - 0 \\ &= 10 \end{aligned}$$

Suppose we take "6" classes of equal size
So, width of equal class interval would be $10/6 = 1.66 \Rightarrow (2)$

Frequency Distribution of number of Children born

Class	Class Boundaries	Tally	Frequency
0-1	-0.5 - 1.5		5
2-3	1.5 - 3.5	 	22
4-5	3.5 - 5.5		12
6-7	5.5 - 7.5		7
8-9	7.5 - 9.5		3
10-11	9.5 - 11.5		1
			<hr/> 56
			P-T-0-9