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Subject: Statistic

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Discrete group frequency distribution table.

⇒ 1, 3, 5, 6, 2, 4, 11, 10, 44, 5, 4, 3, 6, 27
28, 29, 24, 12, 11, 13, 33, 45, 44, 11, 12, 25, 18
14, 15, 14, 1, 3, 12, 26, 18, 14, 15, 11, 3, 5
5, 1, 11, 25, 24, 6, 8, 9, 11, 33, 45, 44, 50
1, 6, 5, 44, 22, 29, 24, 11, 13, 33, 12, 44
42, 23, 15, 44, 44, 55, 56, 49, 46, 26, 30
31, 33, 48, 42, 41, 1, 6, 8, 4, 5, 3, 12,
11, 19, 23, 24, 25, 29, 26, 26, 27, 67, 68
74, 75.

Now to make the table.

To make the ~~data~~ table first we have to
scan the data we and find the
largest data is 99 and the
smallest is 1 so

The range is $99 - 1 = 98$

Suppose we take 10 classes

of equal then

$$n = \frac{98}{10} = 9.8 \approx 10 \quad \text{but we will}$$

consider it as 10

| Class | Entries | Tally | freq- |
|--------|--|-------|-------|
| 1-10 | 1, 3, 5, 6, 2, 4, 10, 5, 4, 3, 6, 3, 3 5, 5, 1, 6, 3, 5, 5, 6, 2, 5, 4, 3 | | 29 |
| 11-20 | 11, 12, 13, 14, 15, 14, 12, 12, 15, 11 11, 11, 11, 13, 12, 12, 12, 11 | | 23 |
| 21-30 | 27, 28, 29, 24, 25, 26, 25, 24, 28 29, 24, 23, 26, 23, 24, 25, 30 | | 18 |
| 31-40 | 33, 33, 33, 31, 33 | | 5 |
| 41-50 | 44, 45, 44, 45, 44, 44, 44, 44 49, 46, 43, 42, 41 | | 14 |
| 51-60 | 50, 55, 56 | | 3 |
| 61-70 | 67, 68 | | 2 |
| 71-80 | 74, 75 | | 2 |
| 81-90 | 86 | | 1 |
| 91-100 | 96, 99 | | 2 |

total = 100.

b). Contentious class boundaries

| Class | C-boundaries | Class marks | Frequency |
|--------|--------------|-------------|-----------|
| 1-10 | 0.5-10.5 | 5.5 | 29 |
| 11-20 | 10.5-20.5 | 15.5 | 23 |
| 21-30 | 20.5-30.5 | 25.5 | 18 |
| 31-40 | 30.5-40.5 | 35.5 | 5 |
| 41-50 | 40.5-50.5 | 45.5 | 14 |
| 51-60 | 50.5-60.5 | 55.5 | 3 |
| 61-70 | 60.5-70.5 | 65.5 | 2 |
| 71-80 | 70.5-80.5 | 75.5 | 2 |
| 81-90 | 80.5-90.5 | 85.5 | 1 |
| 91-100 | 90.5-100.5 | 95.5 | 2 |

total = 100

Arithmetic means

Formula:- $\bar{X} = \frac{\sum x_i}{n}$

$$\bar{X} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$$

putting values

$$\bar{x} = \frac{1 + 3 + 5 + \dots + 75}{100}$$

$$\bar{x} = \frac{2472}{100}$$

$$\bar{x} = 24.72 \text{ Ans}$$

Geometric means

Formula:

$$G.M = \sqrt[n]{x_1 \cdot x_2 \cdot x_3 \cdot \dots \cdot x_n}$$

or $(x_1 \cdot x_2 \cdot x_3 \cdot \dots \cdot x_n)^{1/n}$

putting values:

$$(1 \cdot 3 \cdot 5 \cdot \dots \cdot 75)^{1/100}$$

$$G.M = 14.98 \text{ --- Average.}$$

Harmonic means

Formula:

$$H.M = \frac{n}{\sum = 1 \frac{1}{x_i}}$$

$$H.M = \frac{n}{\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \dots + \frac{1}{x_n}}$$

putting values:

$$H.M = \frac{100}{\frac{1}{1} + \frac{1}{3} + \frac{1}{5} + \dots + \frac{1}{75}} = 7.347 \text{ Average}$$

| X | frequency | Cumulative frequency. |
|------------------------|-----------|-----------------------|
| 1-10 | 29 | 29 |
| 11-20 | 24 | 53 |
| 21-30 | 18 | 71 |
| 31-40 | 5 | 76 |
| 41-50 | 14 | 90 |
| 51-60 | 3 | 93 |
| 61-70 | 2 | 95 |
| 71-80 | 2 | 97 |
| 81-90 | 1 | 98 |
| 91-100 | 2 | 100 |
| total = $\sum f = 100$ | | |

To find out median for a grouped data we have to figure cumulative frequency point first.

Median is the average of the total observation.

i.e median $\frac{1}{2}(n)$

$$m = \frac{1}{2}(100)$$

$$m = \frac{100}{2}$$

$$m = 50 \text{ Answer for}$$

while the Median.

mode is the highest among the interval.

Q3 Find Quartile of Discrete frequency Distribution table. (5)

Ans Quartile: Quartile to divide ~~frequency~~ the total observation into four equal groups.

To find Quartile we use formula.

$$Q_1 = \left(\frac{n+1}{4} \right)$$

now to find the Quartile of Discrete frequency Distribution table

$Q_1 = \left(\frac{n+1}{4} \right)$ as we know the number of frequency is 100
so

Putting value

$$Q_1 = \left(\frac{100+1}{4} \right) \Rightarrow Q_1 = \frac{101}{4} \Rightarrow Q_1 = 25.25$$

Arithmetic means

Now to find Q_2 same formula: (7)

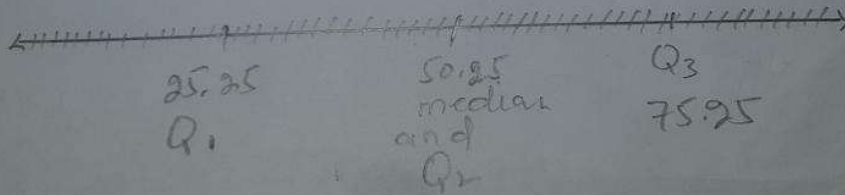
$$Q_2 = \left(\frac{2n+1}{4} \right) \Rightarrow Q_2 = \left(\frac{2(100)+1}{4} \right) \Rightarrow Q_2 = \left(\frac{200+1}{4} \right)$$

$$Q_2 = \left(\frac{201}{4} \right) \Rightarrow Q_2 = 50.25$$

To find Q_3

$$Q_3 = \left(\frac{3n+1}{4} \right) \Rightarrow Q_3 = \left(\frac{3(100)+1}{4} \right) \Rightarrow Q_3 = \left(\frac{300+1}{4} \right)$$

$$Q_3 = \left(\frac{301}{4} \right) \Rightarrow Q_3 = 75.25$$



Find the following of the discrete grouped frequency distribution table.

Range

To find range we use formula of subtracting lowest interval of class boundary from the highest as we know that the lowest class boundary is 100.5 and the highest is 100.5 so

$$\text{Range} = 100.5 - 0.5 = 100 - \text{R}$$

Quartile Range

For ~~Quartile~~ Quartile range we have to subtract the lowest which is Q₁ from the highest which is Q₃ so

⇒

$Q_R = Q_2 - Q_1$
as we already know that from our
Previous result that $Q_3 = 75.25$ and $Q_1 = 25.25$

$$Q_R = Q_3 - Q_1$$

$$Q_R = 75.25 - 25.25$$

$$Q_R = 50$$

⇒ Semi Inter Quartile Range:

To find semi inter quartile range you have to divide the quartile range or 2.
Formula:

$$Q_R = \frac{Q_3 - Q_1}{2}$$

Putting data $\frac{75.25 - 25.25}{2} \rightarrow Q_R = \frac{50}{2} = 25$