PRESENTATION OF DATA

⇒ Methods
- → Textual Method
  - Rearrange from lowest to highest
  - Stem & leaf plot
- → Tabular Method
  - Frequency Distribution
  - Commutative Frequency Distribution
  - Percentage Frequency Distribution
- → Graphs
  - Histogram
  - Frequency Polygon
  - Frequency curve

MEASURES OF CENTRAL TENDENCY

⇒ Arithematic Mean
- → Population

$$\mu = \frac{x_1 + x_2 + x_3 + \ldots x_n}{N}$$

- → Sample

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

⇒ Geometric Mean

$$G.M = \frac{(x_1 \cdot x_2 \cdot x_3 \cdots x_n)^{1/N}}{N} \quad OR \quad \left[\prod_{i=1}^{N} x_i\right]^{\frac{1}{N}}$$

OR $G.M = \text{Antilog}\left[\frac{\sum_{i=1}^{N} \log x_i}{N}\right]$

⇒ Harmonic Mean

$$\frac{N}{\frac{1}{x_1}+\frac{1}{x_2}+\frac{1}{x_3}+\dots+\frac{1}{x_n}}$$

OR

$$\frac{N}{\sum_{i=1}^{N}\left(\frac{1}{x_i}\right)}$$

⇒ Median

Mid Value after sorting

⇒ Mode

Most repeated value.

MEASURES OF DISPURTION

⇒ ABSOLUTE MEASURES

⇒ Range

$X_{max} - X_{min}$

⇒ Mean Deviation (M.D)

Population

$$M.D = \frac{\sum_{i=1}^{N} |x_i - \mu|}{N}$$

Sample

$$M.D = \frac{\sum_{i=1}^{n} |x_i - \bar{x}|}{n}$$

→ Varience

$$\delta^2 = \sum_{i=1}^{N} \frac{(X_i - \mu)^2}{N} \rightarrow \text{Population}$$

$$\delta^2 = \sum_{i=1}^{n} \frac{(X_i - \bar{X})^2}{n} \rightarrow \text{Sample}$$

→ Standard Deviation (S.D)

$$\delta = \sqrt{\text{Varience}}$$

OR

$$\delta = \sqrt{\sum_{i=1}^{N} \frac{(X_i - \mu)^2}{N}} \Rightarrow \text{Population}$$

$$\delta = \sqrt{\sum_{i=1}^{n} \frac{(x_i - \bar{x})^2}{n}} \Rightarrow \text{Sample}$$

⇒ RELATIVE MEASURES

→ Coeff of Range

$$\frac{X_{max} - X_{min}}{X_{max} + X_{min}}$$

→ Coeff of Mean Deviation (M.D)

$$\frac{M.D}{Mean} \times 100$$

→ Coeff of Varience

$$\frac{\text{Standard Deviation}}{\text{Mean}} \times 100$$

⇒ ABSOLUTE MEASURES OF SKEWNESS

→ Symmetric

Mean = Median = Mode

Mean − Median = 0

Mean − Mode = 0

→ Positive/Right Skewed

Mean > Median > Mode

Mean − Median > 0

Mean − Mode > 0

→ Negative/Left Skewed

Mean < Median < Mode

Mean − Median < 0

Mean − Mode < 0

⇒ PEARSON COEFF OF SKEWNESS

$$SKP = \frac{\text{Mean} - \text{Mode}}{\text{Standard Deviation}}$$

$$\text{OR} \quad \frac{3(\text{Mean} - \text{Mode})}{S.D}$$

$$\beta_1 = \frac{\mu_3^2}{\mu_2^3}$$

$$\beta_2 = \frac{\mu_4}{\mu_2^2}$$

=> MOMENTS

→ r^{th} Moment about Mean

$$\mu_r = \frac{(x_i - \mu)^r}{N}$$

$$\mu_1 = \frac{(x_i - \mu)^1}{N}$$

$$\mu_2 = \frac{(x_i - \mu)^2}{N} = \delta^2$$

$$\mu_3 = \frac{(x_i - \mu)^3}{N}$$

$$\mu_4 = \frac{(x_i - \mu)^4}{N}$$

→ Coeff of Skewness

$$\gamma_1 = \sqrt{\beta_1}$$

OR

$$\gamma_1 = \sqrt{\frac{\mu_3^2}{\mu_2^3}}$$

OR

$$\gamma_1 = \frac{\mu_3}{\mu_2^{3/2}}$$

⇒ MEASURES OF KURTOSIS

$$\gamma_2 = \beta_2 - 3$$

OR

$$\gamma_2 = \frac{\mu_4}{\mu_2^2} - 3 \qquad \therefore \mu_2 = \delta^2$$

OR

$$\gamma_2 = \frac{\mu_4}{\delta^4} - 3$$

$\gamma_2 > 0$ → lepto kurtic

$\gamma_2 = 0$ → Meso kurtic

$\gamma_2 < 0$ → Platy kurtic