Correlation

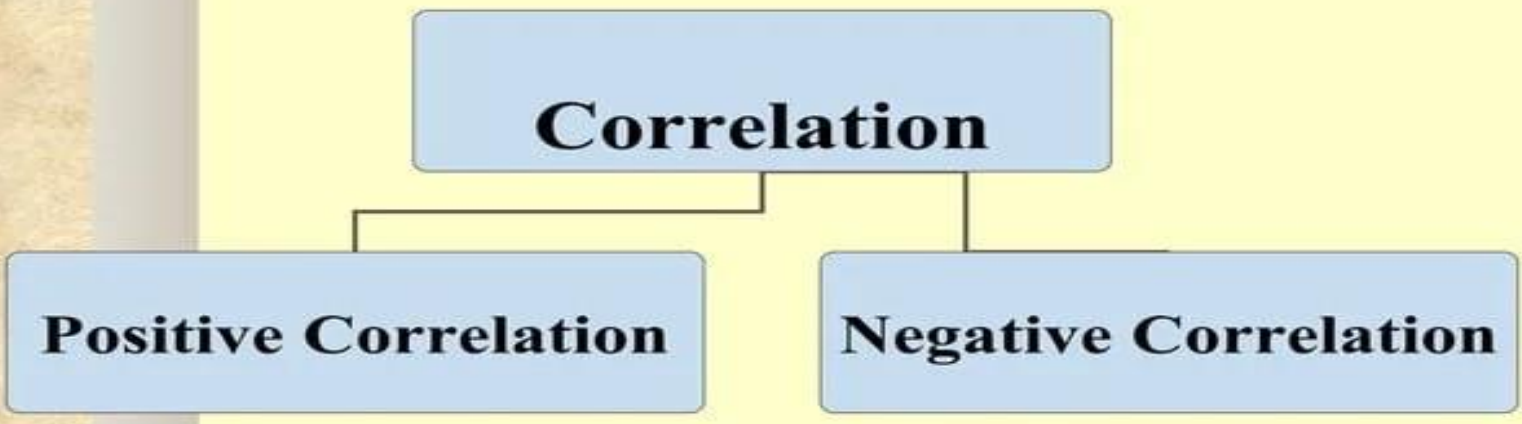
Contents

Correlation

- Correlation is a statistical tool that helps to measure and analyze the degree of relationship between two variables.
- Correlation analysis deals with the association between two or more variables.

- The measure of correlation called the correlation coefficient .
- The degree of relationship is expressed by coefficient which range from correlation **($-1 \leq r \geq +1$)**
- The direction of change is indicated by a sign.
- The correlation analysis enable us to have an idea about the degree & direction of the relationship between the two variables under study.

Types of Correlation



- **Positive Correlation:** The correlation is said to be positive correlation if the values of two variables changing with same direction.

  Ex. Pub. Exp. & sales, Height & weight.

- **Negative Correlation:** The correlation is said to be negative correlation when the values of variables change with opposite direction.

  Ex. Price & qty. demanded.

Direction of the Correlation

- **Positive relationship** – Variables change in the same direction.
  - As X is increasing, Y is increasing
  - As X is decreasing, Y is decreasing
  - E.g., As height increases, so does weight.

Indicated by sign: (+) or (-).

- **Negative relationship** – Variables change in opposite directions.
  - As X is increasing, Y is decreasing
  - As X is decreasing, Y is increasing
  - E.g., As TV time increases, grades decrease

More Examples

- **Positive relationships**
- water consumption and temperature.
- study time and grades.

- **Negative relationships:**
- alcohol consumption and driving ability.
- Price & quantity demanded

Karl Pearson's Coefficient of Correlation

- Pearson's 'r' is the most common correlation coefficient.
- Karl Pearson's Coefficient of Correlation denoted by- 'r' The coefficient of correlation 'r' measure the degree of linear relationship between two variables say x & y.

Karl Pearson's Coefficient of Correlation

- Karl Pearson's Coefficient of Correlation denoted by- r

  $-1 \leq r \leq +1$

- Degree of Correlation is expressed by a value of Coefficient
- Direction of change is Indicated by sign

(- ve) or (+ ve)

Interpretation of Correlation Coefficient (r)

- The value of correlation coefficient ‘r’ ranges from -1 to +1
- If r = +1, then the correlation between the two variables is said to be perfect and positive
- If r = -1, then the correlation between the two variables is said to be perfect and negative
- If r = 0, then there exists no correlation between the variables