

Correlation

→ Introduction:

We have studied the frequency distributions of single variables. Since, only one variable was involved, this type of statistical analysis is called Univariate analysis. But Regression and Correlation techniques deal with the problems in which two or more than two variables are involved, this type of statistical analysis called Bivariate analysis. These techniques help in measuring the independence or relationship between bivariate data and predict the value of one variable for the given value of the other. However, the extent of accuracy in prediction depends upon closeness of relationship or what may be called as the strength of correlation b/w the two variables.

→ Definitions:

A/c to Prof Boddington,

"Whenever some definite connections exists between the two or more groups, classes, or series of data, there is said to be correlation."

→ When two phenomena are varying simultaneously in the same direction or in the opposite directions, and the variation in the one is the cause of the variation in the other, the two phenomena are said to be correlated.

Correlation refers to the relationship of variables. Some relationship is found in certain type of variables.

For example: There exists a relationship between price and demand, production and employment, wages and price index, heights and weight, capital invested and profits earned etc.

In statistical analysis, the concept and technique of correlation is of great importance. The fundamentals of this concept were first, propounded by the French astronomer, Bravais, but correlation technique as such was first investigated graphically by Sir Francis Galton. In 1896, Karl Pearson introduced a method of assessing correlation by means of coefficient of

Correlation. These two statisticians (Galton and Pearson) studied many problems of Biology and Genetics with the help of this technique.

→ Types of Correlation:

On the basis of nature of relationship between the variables i.e., the direction in which changes takes place in them or the ratio by which they change, Correlation may be:

(1). Positive or Negative Correlation:

'Positive' or 'direct' correlation refers to the movement of the variables in the same direction. As one variable increases the other also increases. or as one decreases, the other also decreases. This sort of correlation exists between supply and price of a commodity.

for ex:- when price of a commodity increases, the supply of that commodity also increases and vice-versa.

'Negative' or 'inverse' correlation refers to, when one variable increases or decreases, the other moves in the reverse direction. Such a correlation is found b/w price and demand. When price of a commodity increases its demand goes down or vice-versa.

(2). Simple, Partial or Multiple Correlation:

When only two variables are involved in the measuring of correlation, the analysis of relationship between them is described as simple correlation.

When more than two variables are involved then it is called Multiple correlation.

ex: when we study relationship b/w say, agriculture production, rainfall and amount of fertilizers used it will be multiple correlation.

In partial correlation, the relationship of two variables is studied by eliminating the effect of other variable from both.

(3). Linear or Non-Linear Correlation :

If the ratio of change b/w two variables is uniform then there will be linear correlation between them. Their relationship is best described by a straight line.

If the ratio of change b/w two variables is not constant or uniform then it is called Non-linear correlation. It can be also said curvilinear.

