“Correlation is a relationship or dependence. It is the fact that two things or variables are so related that change in one is accompanied by a corresponding or parallel change in the other.”

**According to Ferguson:**

“Correlation is concerned with describing the degree of relation between two variables.”

**According to Guilford:**

“A coefficient of correlation is a single number that tells us to what extent two things are related, to what extent variation in one go with variations in the other.”

**Types of Correlation:**

**1. Positive Correlation:**

If the weight of an individual increases in proportion to increase in his height, the relation between this increase of height and weight is called as positive correlation. It ranges from 0 to + 1. If it is 0 then there is no relation at all. When it is + 1, then there is perfect positive correlation.

**2. Negative Correlation:**

It is just the opposite of positive correlation. If the weight of an individual does not increase in proportion to increase in his height or if the weight of an individual decreases with an increase in height, then it is said to be negative correlation, also ranges from 0 to -1. -1 is perfect negative correlation.

**3. Zero Correlation:**

Zero correlation is a correlation showing no relationship, or a correlation having a correlation coefficient of zero.

**Importance of Correlation:**

Correlation is very important in the field of Psychology and Education as a measure of relationship between test scores and other measures of performance. With the help of correlation, it is possible to have a correct idea of the working capacity of a person. With the help of it, it is also possible to have a knowledge of the various qualities of an individual.

After finding the correlation between the two qualities or different qualities of an individual, it is also possible to provide his vocational guidance. In order to provide educational guidance to a student in selection of his subjects of study, correlation is also helpful and necessary.

**Methods of Finding Out the Correlation:**

Various persons have suggested various methods for finding out correlation.

**Two methods that are prevalent and important are:-**

1. Rank order method.

2. Product Moment method.

## What is the Chi-Square Test?

The Chi-Square test is a statistical procedure used by researchers to examine the differences between categorical variables in the same population.

For example, imagine that a research group is interested in whether or not education level and marital status are related for all people in the U.S.

After collecting a simple random sample of 500 U.S. citizens, and administering a survey to this sample, the researchers could first manually observe the frequency distribution of marital status and education category within their sample.

The researchers could then perform a Chi-Square test to validate or provide additional context for these observed frequencies.

## **Types of Chi-square tests**

You use a Chi-square test for hypothesis tests about whether your data is as expected. The basic idea behind the test is to compare the observed values in your data to the expected values that you would see if the null hypothesis is true.

There are two commonly used Chi-square tests: the [Chi-square goodness of fit test](https://www.jmp.com/en_ch/statistics-knowledge-portal/chi-square-test/chi-square-goodness-of-fit-test.html) and the [Chi-square test of independence](https://www.jmp.com/en_ch/statistics-knowledge-portal/chi-square-test/chi-square-test-of-independence.html). Both tests involve variables that divide your data into categories. As a result, people can be confused about which test to use. The table below compares the two tests.

## **How to perform a Chi-square test**

For both the [Chi-square goodness of fit test](https://www.jmp.com/en_ch/statistics-knowledge-portal/chi-square-test/chi-square-goodness-of-fit-test.html) and the [Chi-square test of independence](https://www.jmp.com/en_ch/statistics-knowledge-portal/chi-square-test/chi-square-test-of-independence.html), you perform the same analysis steps, listed below. Visit the pages for each type of test to see these steps in action.

1. Define your null and alternative hypotheses before collecting your data.
2. Decide on the alpha value. This involves deciding the risk you are willing to take of drawing the wrong conclusion. For example, suppose you set α=0.05 when testing for independence. Here, you have decided on a 5% risk of concluding the two variables are independent when in reality they are not.
3. Check the data for errors.
4. Check the assumptions for the test. (Visit the pages for each test type for more detail on assumptions.)
5. Perform the test and draw your conclusion.

Both Chi-square tests in the table above involve calculating a test statistic. The basic idea behind the tests is that you compare the actual data values with what would be expected if the null hypothesis is true. The test statistic involves finding the squared difference between actual and expected data values, and dividing that difference by the expected data values. You do this for each data point and add up the values.

Then, you compare the test statistic to a theoretical value from the [Chi-square distribution](https://www.jmp.com/en_ch/statistics-knowledge-portal/chi-square-test/chi-square-distribution.html). The theoretical value depends on both the alpha value and the degrees of freedom for your data.