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Linear Regression Equation

The measure of the extent of the relationship between two variables is shown by the **correlation coefficient**. The range of this coefficient lies between -1 to +1. This coefficient shows the strength of the association of the observed data for two variables.

A linear regression line equation is written in the form of:

Y = a + bX

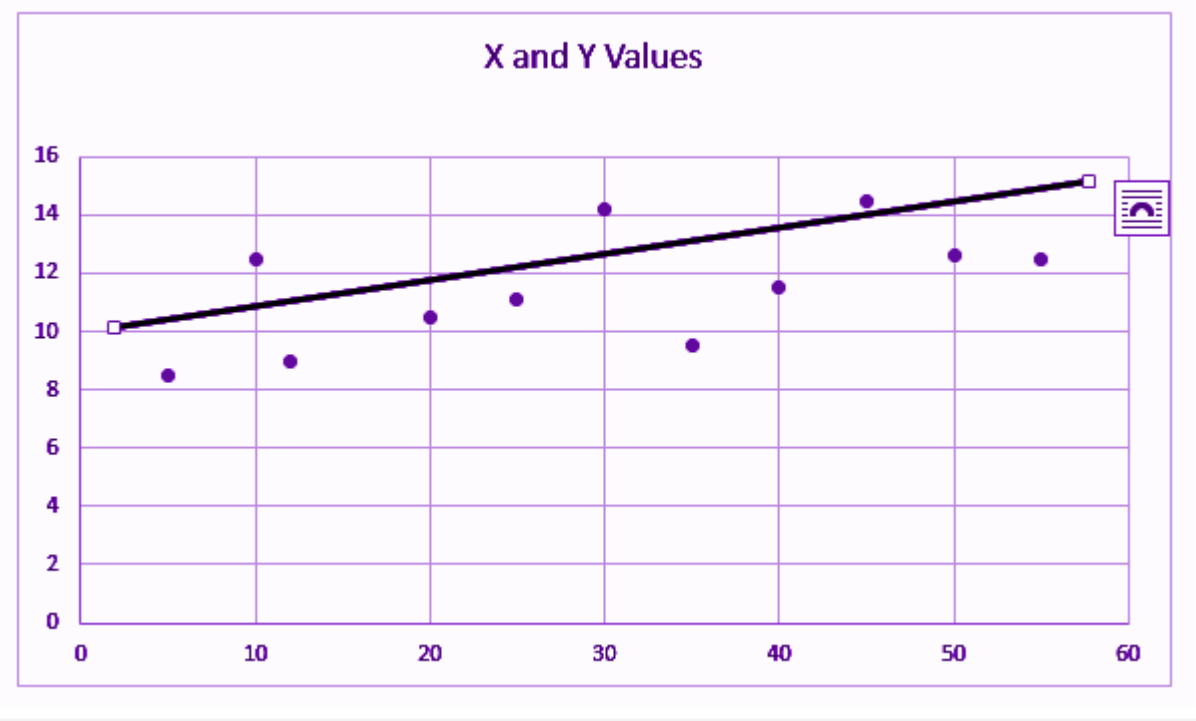
where X is the independent variable and plotted along the x-axis

Y is the dependent variable and plotted along the y-axis

The slope of the line is b, and a is the intercept (the value of y when x = 0).

Least Square Regression Line or Linear Regression Line

The most popular method to fit a regression line in the XY plot is the method of least-squares. This process determines the best-fitting line for the noted data by reducing the sum of the squares of the vertical deviations from each data point to the line. If a point rests on the fitted line accurately, then its perpendicular deviation is 0. Because the variations are first squared, then added, their positive and negative values will not be cancelled.



Linear regression determines the straight line, called the least-squares regression line or LSRL, that best expresses observations in a bivariate analysis of data set. Suppose Y is a dependent variable, and X is an independent variable, then the population regression line is given by;

$Y = B_0 + B_1 X$

Where

B_0 is a constant

B_1 is the regression coefficient

If a random sample of observations is given, then the regression line is expressed by;

$\hat{y} = b_0 + b_1 x$

where b_0 is a constant, b_1 is the regression coefficient, x is the independent variable, and $\hat{y}$ is the predicted value of the dependent variable.