Linear Regression

Linear regression attempts to model the relationship between two variables by fitting a linear equation to observed data. One variable is considered to be an explanatory variable, and the other is considered to be a dependent variable.

A linear regression line has an equation of the form:

***Y = a + bX***

***X*** is the independent variable and ***Y*** is the dependent variable. The slope of the line is ***b***, and ***a*** is the intercept (the value of ***y*** when ***x*** = 0).

Linear Regression is done by supervised learning. Supervised learning is where you have input variables (x) and an output variable (Y) and you use an algorithm to learn the mapping function from the input to the output.

Y = f(X)

The goal is to approximate the mapping function so well that when you have new input data (x) that you can predict the output variables (Y) for that data.

It is called supervised learning because the process of an algorithm learning from the training dataset can be thought of as a teacher supervising the learning process. We know the correct answers, the algorithm iteratively makes predictions on the training data and is corrected by the teacher. Learning stops when the algorithm achieves an acceptable level of performance.

Linear-regression models are relatively simple and provide an easy-to-interpret mathematical formula that can generate predictions. Linear regression can be applied to various areas in business and academic study.

You’ll find that linear regression is used in everything from biological, behavioural, environmental and social sciences to business. Linear-regression models have become a proven way to scientifically and reliably predict the future. Because linear regression is a long-established statistical procedure, the properties of linear-regression models are well understood and can be trained very quickly.

Examples on using Linear Regression models in Real Life:

crop yields on rainfall : Yield is Dependent variable (Nothing but Output which we forecast), Rainfall is explanatory variable

marks on activities : Marks is dependent and activities explanatory

*Products on sales: Sales are explanatories*

Impact of SAT Score (or GPA) on College Admissions

Impact of product price on number of sales

Impact of rainfall amount on number fruits yielded

Impact of blood alcohol content on coordination