

Conceptual Understanding of Logistic Regression for Data Science Beginners

Logistic Regression

Logistic regression is a [supervised machine learning](#) algorithm mainly used for [classification](#) tasks where the goal is to predict the probability that an instance of belonging to a given class.

It is used for classification algorithms its name is logistic regression. it's referred to as regression because it takes the output of the [linear regression](#) function as input and uses a sigmoid function to estimate the probability for the given class

The [difference between linear regression and logistic regression](#) is that linear regression output is the continuous value that can be anything while logistic regression predicts the probability that an instance belongs to a given class or not.

Logistic Regression is used when the dependent variable(target) is categorical.

For example,

- To predict whether an email is spam (1) or (0)

Types of Logistic Regression

1. Binary Logistic Regression

The categorical response has only two 2 possible outcomes. Example: Spam or Not

2. Multinomial Logistic Regression

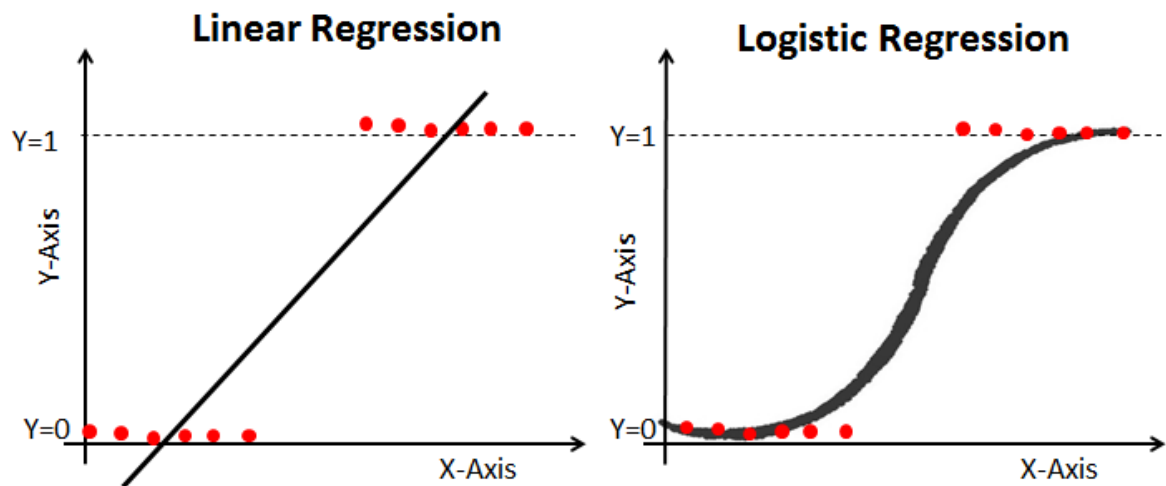
Three or more categories without ordering. Example: Predicting which food is preferred more (Veg, Non-Veg, Vegan)

3. Ordinal Logistic Regression

Three or more categories with ordering. Example: Movie rating from 1 to 5

Sr.No	Linear Regresssion	Logistic Regression
1	Linear regression is used to predict the continuous dependent variable using a given set of independent variables.	Logistic regression is used to predict the categorical dependent variable using a given set of independent variables.
2	Linear regression is used for solving Regression problem.	It is used for solving classification problems.

Sr.No	Linear Regresssion	Logistic Regression
3	In this we predict the value of continuous variables	In this we predict values of categorical variables
4	In this we find best fit line.	In this we find S-Curve.
5	Least square estimation method is used for estimation of accuracy.	Maximum likelihood estimation method is used for Estimation of accuracy.
6	The output must be continuous value, such as price, age, etc.	Output is must be categorical value such as 0 or 1, Yes or no, etc.
7	It required linear relationship between dependent and independent variables.	It not required linear relationship.
8	There may be collinearity between the independent variables.	There should not be collinearity between independent variable.



Cost Function in Logistic Regression

