**Conceptual Understanding of Logistic Regression for Data Science Beginners**

## **Logistic Regression**

Logistic regression is a [supervised machine learning](https://www.geeksforgeeks.org/supervised-unsupervised-learning/) algorithm mainly used for [classification](https://www.geeksforgeeks.org/getting-started-with-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](https://www.geeksforgeeks.org/ml-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](https://www.geeksforgeeks.org/ml-linear-regression-vs-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** |
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| **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. |
| **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. |

## linear vs logistic regression **Cost Function in Logistic Regression**

 