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**Logistic Regression**

Logistic regression is an example of a regression analysis which is used to model binary dependent outcome. Logistic regression is the method used for binary classification problems (with two class values). The logistic regression outcome would be assigned a probability of an outcome like pass/fail, win/lose, etc.

The logistic regression can be considered as supervised learning as the desired outcome is evident from the data. The logistic regression mathematically is modelled by assigning two possible values to the dependent variable: ‘0’ and ‘1’,the transformation process is carried out by using a function that transforms log odds to probability .

Logistic regression can be used in a situation where ordinary linear regression is not appropriate in predicting outcomes that have binary data. Using linear regression will mean the predicted values will become less than zero and greater than one.

Linear regression assumes homoscedasticity (constant variance) of the dependent variable(y) across all values of the independent variable(s) (x). However, when using binary variables, the assumption of homoscedasticity does not function as the variance decreases with higher number of values and vice versa.

**SVM (Support Vector Machine)**

The aim of the SVM classification algorithm is to find a hyperplane that differentiates two classes of data points. The SVM is used in separating two classes of data is possible with many hyperplanes to be chosen, however, the aim is to find the hyperplane with the optimal margin i.e., has the highest distance between data points in the data. With a higher distance margin between the different classes of data, other data points can be classified with more certainty.

The classes can either be separated by a line (linearly separable) or a plane. The dimension of the hyperplane is dependent on the number of features. With two features, the hyperplane is just a line and with three features, the hyperplane is a two dimensional plane. The hyperplanes are the boundaries that distribute the data points into the different classes. The data points on the different sides of the hyperplane can be distributed to different classes.

Chart, scatter chart

Description automatically generated

Figure :Hyperplanes in 2D and 3D feature space (Source: [Support Vector Machine — Introduction to Machine Learning Algorithms | by Rohith Gandhi | Towards Data Science](https://towardsdatascience.com/support-vector-machine-introduction-to-machine-learning-algorithms-934a444fca47))