**Logistic Regression**

Logistic Regression is one of the statistical models. It is used in classification problems.

Can we solve liner problem using logistic regression?

The answer is No. Because there we find outliers. If outliers are more, then best fit line in linear regression may changes.

We can solve logistic regression by using sigmoid activation function.

In logistic regression, sometimes we may get non convex function, there we will be finding many more local minima’s instead of one Global Minima. So we need to get convex function, then only we can able to predict the data correctly.

By changing our cost function in to log loss cost function, we can easily get convex function.

Here never get local minima.

As usual we can minimise the cost function using convergence algorithm.

Performance Metrics:

Confusion Matrix

Accuracy

Precision

Recall

F-beta score

Confusion Matrix: it’s 2\*2 matrix (Actual value and predicted value)

Accuracy: It is the ratio of sum of all the truth values (TP+TN) and sum of all values of truth positive and negative, false positive and negative. (TP+TN+FP+FN)

TP+TN/(TP+TN+FP+FN)

Precision: It is the ratio of truth positive (TP) with the sum of all the positive values(TP,FP)

TP/ (TP+FP)

Recall: It is the ratio of truth positive (TP) with the sum of all the truth positive and false negative values (TP, FP)

TP/(TP+FN)

F-beta score: square of(1+beta)(precision\*recall)/square of beta(precision+recall)