# MODEL EVALUATION METRICS

## CONFUSION MATRIX

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| --- | --- | --- |
|  | Guessed Positive | Guessed Negative |
| Positive | True positive | False negative |
| Negative | False Positive | True Negative |

## ACCURACY

* It is one of the most efficient ways to evaluate a model.
* Accuracy = (True positive + true Negative)/Total Population
* Sklearn=>accuracy\_score
* Accuracy alone cant be used everywhere as in the example of fraudulent credit card transactions when number of transaction are high a model with even 99% accuracy fails to identify the fraudulent ones.

## PRECISION

* Punishes false positives
* Precision = True Positive/(True Positive + False Positive)

## RECALL

* Punishes false negatives
* Recall = True Positive/(True positive + False Negative)

## F1 SCORE

* F1 Score = HarmonicMean(Precision,Recall)
* HarmonicMean(x,y) =2\*x\*y/(x+y)

## FBETA SCORE

* F Beta = (1+beta\*beta)\*2\*precision\*recall/(beta\*beta\*x +y)
* If beta is large its closer to the recall ,if beta is small its closer to precision

## RECIEVER OPERATING CHARACTERISTICK CURVE

* True positive rate = true positive/total
* Helps to determine nature of split
* We obtain roc curve by plotting the points of (true positive rate, false positive rate)
* If area under roc curve is 1 its perfect split, if its 0.8 it’s a good split and if it’s 0.5 it’s a random split

For regression we have mean absolute error,mean squared error and r2 score

R2 Score = 1 – mean square error(present model)/mean square error(simple model)

It’s a good model if R2 is close to 1