Evaluation Metrics for Machine Learning Algo

Confusion Matrix

- Gives a matrix as output and describes the complete performance of the model.

- assume we have a binary classification problem- YES or NO.

- classifier which predicts a class for a given input sample.

Confusion Matrix

	Class 1 Predicted	Class 2 Predicted
Class 1 Actual	TP	FN
Class 2 Actual	FP	TN

- Positive (P) : Observation is positive class = yes.

- Negative (N) : Observation is not positive, class = no.

- True Positive (TP) : Observation is positive, and is predicted to be positive.

- False Negative (FN) : Observation is positive, but is predicted negative.

- True Negative (TN) : Observation is negative, and is predicted to be negative.

- False Positive (FP) : Observation is negative, but is predicted positive.

Evaluation Metrics

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN}$$

$$Recall = \frac{TP}{TP + FN}$$

$$Precision = \frac{TP}{TP + FP}$$

$$F\text{-}measure = \frac{2*Recall*Precision}{Recall + Precision}$$

Confusion Matrix

- On testing the model on 165 samples, results are

n=165	Predicted: NO	Predicted: YES
Actual: NO	50	10
Actual: YES	5	100

Confusion Matrix

- True Positives : The cases in which we predicted YES and the actual output was also YES.

- True Negatives : The cases in which we predicted NO and the actual output was NO.

- False Positives : The cases in which we predicted YES and the actual output was NO.

- False Negatives : The cases in which we predicted NO and the actual output was YES.

Evaluating using Metrics

- Accuracy = (TP + TN) / (TP + TN + FP + FN)= (100+50) /(100+5+10+50)= 0.90

- Recall=TP / (TP + FN)=100/(100+5)=0.95

- Precision = TP / (TP + FP)=100/ (100+10)=0.91

- Fmeasure=(2*Recall*Precision)/ (Recall+Presision)=(2*0.95*0.91)/ (0.91+0.95)=0.92

Other Evaluation Metrics

- Mean Absolute Error

- Mean Squared Error

- RMSE