* Confusion matrix :

* Why the confusion matrix is named confusion matrix?
Can we use confusion matrix to evaluate the Regression model?

⊕ ➤ Confusion matrix is called confusion matrix because it helps to understand the confusion that occurs when a machine learning model is used to make a prediction.

No, confusion matrix can't be used for regression problem. Confusion matrix is designed for classification problem. In regression problem, the goal is to predict a continuous numeric value. So, in case of regression MSE, RMSE are better metric.

* Sensitivity / Recall: Recall is the fraction of the relevant documents that are successfully ~~retrieved~~ retrieved.

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

It is the number of accurate positive prediction divided by total number of actual positive level.

* **F1 score:** The F1-score is the harmonic average of the precision and recall, where an F1 score reaches its best value at 1 and worst at 0.

$$F1\text{-}score = 2 \times \frac{precision \times recall}{precision + recall}$$

* **Specificity:** Specificity is the number of accurate negative prediction, divided by total number of actual negative label.

$$Specificity = \frac{TN}{TN + FR}$$

* **Area under the curve (AUC):** Shows the performance of model in case of classification. The higher the AUC, the better the model classifies between the class label.

* **Confusion matrix:** Confusion matrix is one of the basic table layout that helps to visualize the performance of a classification and detection related machine learning algorithms.

		True Class Label	
		Positive	Negative
Predicted Class Label	Positive	TP	FP.
	Negative	FN.	TN

* **True positive:** where a model correctly identified a positive instance as positive

False positive: where a model identified a negative instance as positive.

True negative: where a model correctly indified a negative instance as negative.

False negative: where a model identified a positive instance as negative.

* Precision: Precision is the number of accurate positive prediction divided by total number of positive

* Precision: Precision is the fraction of retrieved documents that are relevant.

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

It is the number of accurate positive prediction divided by total number of positive predictions.

* Accuracy: Accuracy is total number of correct predictions, both positive and negative, divided by total number of samples.

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

* Accuracy vs F1-score:

Accuracy is used when the True positives and True negatives are more important while F1-score is used when the False Negatives and False positives are crucial. Accuracy can be used when the class distribution is similar while F1-score is a better metric when there are imbalanced class.

* Receive Operating Curve (ROC): is a probability curve ~~cut~~ curve that is plotted with TPR on the Y-axis against FPR on the X-axis.