

Classification Metrics

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1 Overview

Formulae discussed in this document are for Binary classification(concerning 2 classes). But these can be extended for the case of Multi-class classification(more than 2 classes)

2 Precision, Recall and F1 score

1. **TP**: True Positive(truly/correctly classified as positive)
2. **FP**: False Positive(falsely/incorrectly classified as positive)
3. **TN**: True Negative(truly/correctly classified as negative)
4. **FN**: False Negative(falsely/incorrectly classified as negative)
5. **Precision**

$$Precision = TP / (TP + FP) \quad (1)$$

6. **Recall**(or Sensitivity or True Positive Rate): Represents how many of actual positive samples(TP + FN) have been correctly classified.

$$Recall = TP / (TP + FN) \quad (2)$$

7. **F1 score**: Harmonic mean of Precision and Recall

$$F1score = 2 * Precision * Recall / (Precision + Recall) \quad (3)$$

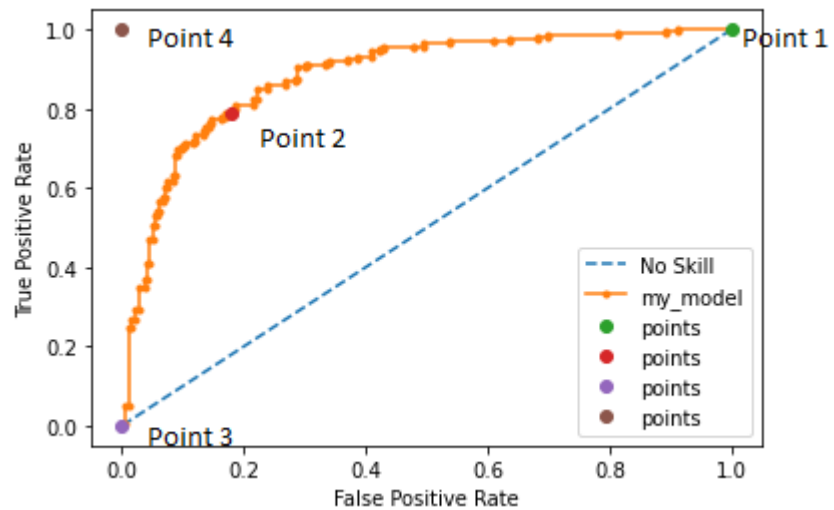
8. **True Negative Rate**(or Specificity): Represents how many of actual negative samples(TN + FP) have been correctly classified.

$$TNR = 1 - FPR = TN / (TN + FP) \quad (4)$$

3 Confusion Matrix

Matrix of dimension 2x2 representing TP, FN, FP, TN

4 Receiver Operating Characteristic Curve and AUC(Area under curve)



[image taken from here.]