Understanding the Confusion Matrix

Confusion Matrix

The confusion matrix is a table that summarizes the performance of a classification model by comparing the predicted labels with the actual labels. It is structured as follows:

Definitions and Formulas

Below are the key metrics derived from the confusion matrix:

- **Accuracy:** Probability that a prediction (positive or negative) is correct:

$$ACC = \frac{TP + TN}{P + N}$$

- **Specificity or True Negative Rate:** Probability that negative class is correctly predicted:

$$SPC = TNR = \frac{TN}{N}$$

- **Recall (Sensitivity) or True Positive Rate:** Probability that a positive class is correctly predicted:

$$REC = \frac{TP}{P}$$

- **Precision:** Probability that a positive prediction is correct:

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

- **F1 Score:** Harmonic mean of precision and recall:

$$F1 = \frac{2TP}{2TP + FP + FN}$$