Confusion_matrix

A confusion matrix is a useful tool in machine learning for evaluating the performance of classification models. It provides a detailed breakdown of how well your model's predictions match the actual labels. Here's a typical structure for a confusion matrix in a binary classification problem:

	Predicted Positive	**Predicted Negative**
Actual Positive	True Positive (TP)	False Negative (FN)
Actual Negative	False Positive (FP)	True Negative (TN)

Definitions:

- **True Positive (TP)**: The number of positive samples correctly classified as positive.
- **False Negative (FN)**: The number of positive samples incorrectly classified as negative.
- **False Positive (FP)**: The number of negative samples incorrectly classified as positive.
- **True Negative (TN)**: The number of negative samples correctly classified as negative.

Precision Recall F1_score

1. **Precision**:
    - Precision is the ratio of true positive predictions to the total number of positive predictions made. It answers the question, "Of all the positive predictions made, how many were actually correct?
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2. **Recall** (also known as Sensitivity or True Positive Rate):
    - Recall is the ratio of true positive predictions to the total number of actual positives. It answers the question, "Of all the actual positives, how many were correctly identified?
3. **F1 Score**:
    - The F1 Score is the harmonic mean of precision and recall. It balances the two metrics, providing a single score to evaluate the model's performance. It's especially useful when dealing with imbalanced classes.

These metrics are commonly used in classification tasks to evaluate the performance of models, particularly when dealing with imbalanced datasets.