Q1 What is the difference between precision and recall ?

Precision and recall are two important metrics used to evaluate the performance of classification models, especially in situations where classes are imbalanced.

**Precision:**

Precision measures how many of the instances that were classified as positive are actually positive.

### ****Recall:****

Recall (also known as Sensitivity or True Positive Rate) measures how many of the actual positive instances were correctly identified by the model.

### ****Key Differences:****

**Precision** is about the quality of the positive predictions (how many of the predicted positives were actually correct).

**Recall** is about the quantity of actual positives identified (how many of the real positives did the model find).

Q2 What is the cross-validation and why is it important in binary classification ?

Cross-validation is a statistical technique used to assess the performance of a machine learning model by dividing the dataset into multiple parts (or folds), training the model on some of these parts, and testing it on the remaining parts. The goal is to get a more reliable estimate of how well the model will perform on unseen data.

Important in Binary Classification

1 Better estimation of model performance

2 Better use of data

3 Helps in model selection and hyperparameter tuning

4 **Improves model robustness**