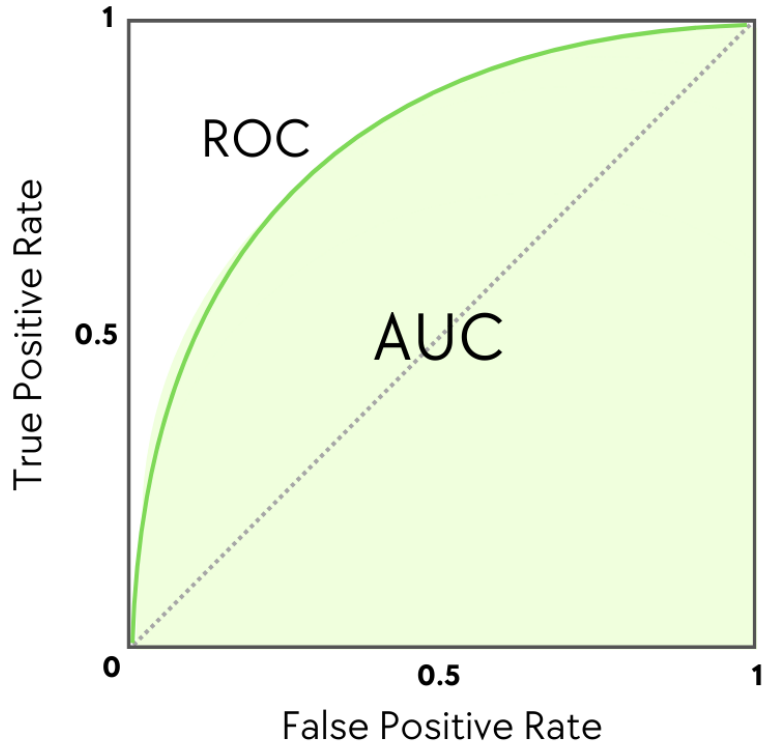
ROC AUC (Receiver Operating Characteristic Area Under the Curve)

key metric in machine learning

ROC AUC

- It is a key metric in machine learning for evaluating **binary classification models**, measuring how well a model distinguishes between positive and negative classes across various thresholds, with a score from 0 to 1 (0.5 is random, 1.0 is perfect), indicating its overall discriminative ability.
- **ROC**: A graph plotting the **True Positive Rate (TPR)** (Sensitivity/Recall) against the **False Positive Rate (FPR)** (1 - Specificity) at different classification thresholds.
- **AUC**: The area beneath the ROC curve, summarized as a single score between 0 and 1.

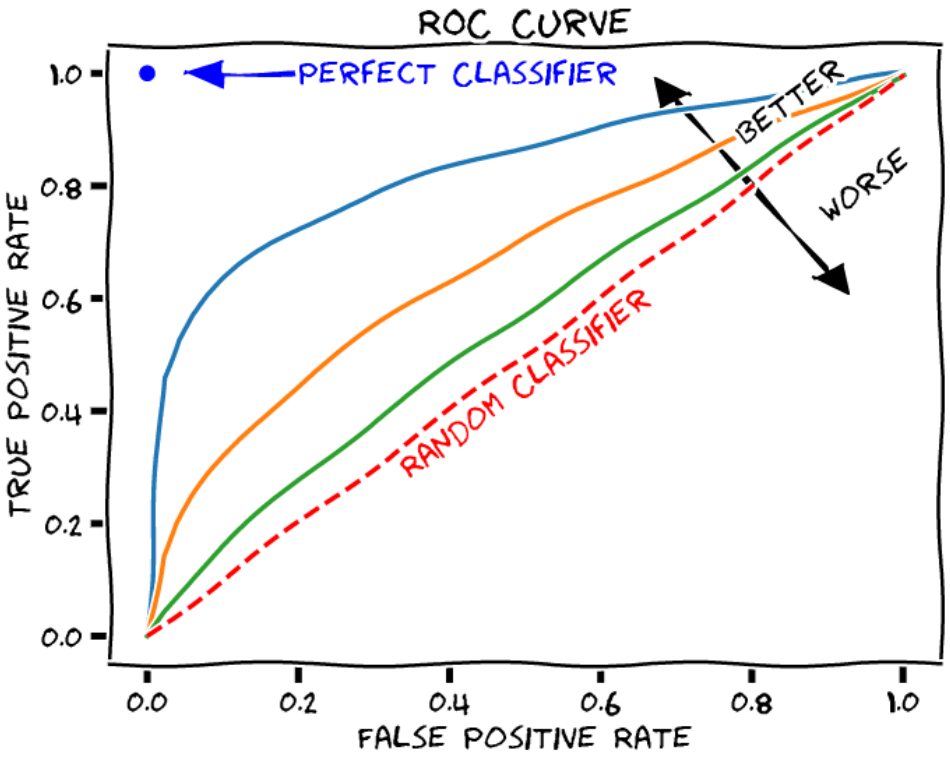


How it works

•It visualizes the trade-off between correctly identifying positive cases (TPR) and incorrectly flagging negatives as positives (FPR).
•A higher AUC means the model is better at separating classes; the curve closer to the top-left corner (perfect TPR, zero FPR) indicates better performance.

AUC value	Meaning
0.5	Useless (like random guessing)
0.6 – 0.7	Poor
0.7 – 0.8	Good
0.8 – 0.9	Very good
> 0.9	Excellent
1.0	Perfect separation

ROC–AUC is **best when**:
•Classes are **imbalanced**
•Model outputs **probabilities**
•You care about **ranking quality**, not fixed threshold



Thank you