Lecture 20 : Model Evaluation

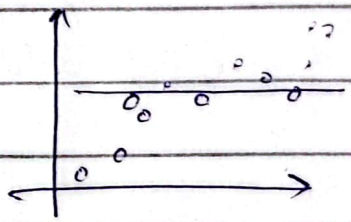
why :- (i) to check the performance of model

(ii) model can have problems → underfit
→ overfit

underfit → training & testing is less.
→ simple algorithm

solution → make it complex

model fails to capture the underlying pattern of the data.

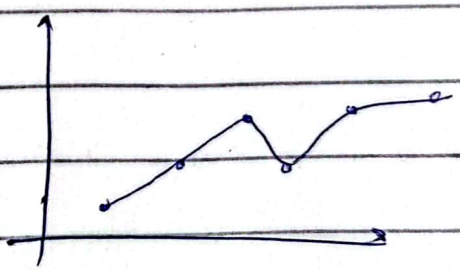


Trying to fit a straight curve to the data that has clear curve.

Overfitting

↳ understand training data too much &
have poor performance in unseen data.

- memorization not generalization
- poor performance on new data.



⇒ good model is balance b/w underfitting & overfitting

our Goal ⇒ Appropriate fitting

- Trade of b/w optimization & generalization

Consequences (Both lead to unreliable predictions)

underfitting ⇒ High (bias) → model consistently gets it wrong

overfitting ⇒ high (variance) performance wildly depends on specific data.

The metrics

① Accuracy → (not good when data is not balanced)

↓ useful when you have balanced dataset. (ratio)

Evaluation for Classification Metrics

① Accuracy

② Confusion Matrix

(describe complete performance of model)

	+ve	-ve
+ve	(i) TP	(iii) FP
-ve	FN	TN (iv)

predicted

actual

TP ⇒ (actual & predicted True)

FP ⇒ (actual True Model predicted false) (ii)

FN ⇒ actual false model predicted True

TN ⇒ (gives -ve model predict -ve)

(2.1) Precision

Precision = no. of True positive / (True positive + false +ve)

(minimize false positive)

2.2 Recall (3 (actual +ve) کوئی ان میں سے ماڈل نے کتنی ٹھیک بتائی)

(minimize false negatives)

$$\text{Recall} = \frac{\text{True positives}}{\text{True positive} + \text{False Negative}}$$