

Confusion Matrix Notes (From Board Papers)

Q1-Imagine that you have come up with an AI based prediction model which has been deployed on the roads to check traffic jams. Now, the objective of the model is to predict whether there will be a traffic jam or not. Now, to understand the efficiency of this model, we need to check if the predictions which it makes are correct or not. Thus, there exist two conditions which we need to ponder upon: Prediction and Reality. Traffic Jams have become a common part of our lives nowadays. Living in an urban area means you have to face traffic each and every time you get out on the road. Mostly, school students opt for buses to go to school. Many times, the bus gets late due to such jams and the students are not able to reach their school on time. Considering all the possible situations make a Confusion Matrix for the above situation.

Ans: Case 1: Is there a traffic Jam?

Prediction: Yes Reality: Yes

True Positive

Case 2: Is there a traffic Jam?

Prediction: No Reality: No

True Negative

Case 3: Is there a traffic Jam?

Prediction: Yes Reality: No

False Positive

Case 4: Is there a traffic Jam?

Prediction: No Reality: Yes

False Negative

Confusion Matrix		Reality	
		Yes	No
Prediction	Yes	True Positive	False Positive
	No	False Negative	True Negative

Q2. What is a confusion matrix? What is it used for?

Ans: The confusion matrix is used to store the results of comparison between the prediction and reality. From the confusion matrix, we can calculate parameters like recall, precision, F1 score which are used to evaluate the performance of an AI model.

(1 mark for definition, 1 mark for use)

Q3-What is F1 Score in Evaluation?

Ans: F1 score can be defined as the measure of balance between precision and recall.

$F1Score = 2 * (Precision * Recall) / (Precision + Recall)$