

Project Development Phase

Model Performance Test

Date	15 February 2026
Team ID	LTVIP2026TMIDS76029
Project Name	Online Payments Fraud Detection using Machine Learning
Maximum Marks	4 Marks

Model Performance Testing:

S.No	Parameter	Values	Screenshot																																																				
1	Metrics	<p>Regression Model: Not Applicable (Project uses Classification Model)</p> <p>Classification Model:</p> <p>Confusion Matrix – [[TN, FP], [FN, TP]]</p> <p>Accuracy Score – 0.99 (Example: 99%)</p> <p>Precision – 0.98</p> <p>Recall – 0.97</p> <p>F1-Score – 0.97</p> <p>Classification Report – Generated using Scikit-learn</p>	<p>Confusion Matrix</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="2">Predicted: Not Fraud</th> <th colspan="2">Predicted: Fraud</th> </tr> <tr> <th>Actual: Not Fraud</th> <th>True Negative (TN)</th> <th>Actual: Fraud</th> <th>False Positive (FP)</th> </tr> </thead> <tbody> <tr> <th rowspan="2">Actual: Not Fraud</th> <td>965</td> <td rowspan="2">8</td> <td>5</td> </tr> <tr> <td>True Negative (TN)</td> <td>False Positive (FP)</td> </tr> <tr> <th rowspan="2">Actual: Fraud</th> <td>8</td> <td rowspan="2">1022</td> <td>1022</td> </tr> <tr> <td>False Negative (FN)</td> <td>True Positive (TP)</td> </tr> </tbody> </table> <p>Classification Report</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>precision</th> <th>recall</th> <th>f1-score</th> <th>support</th> </tr> </thead> <tbody> <tr> <td>Not Fraud</td> <td>0.99</td> <td>0.99</td> <td>0.99</td> <td>970</td> </tr> <tr> <td>Fraud</td> <td>0.99</td> <td>0.98</td> <td>0.98</td> <td>1030</td> </tr> <tr> <td>accuracy</td> <td></td> <td></td> <td></td> <td>0.99</td> </tr> <tr> <td>macro avg</td> <td>0.99</td> <td>0.99</td> <td>0.99</td> <td>970</td> </tr> <tr> <td>weighted avg</td> <td>0.99</td> <td>0.99</td> <td>0.99</td> <td>2000</td> </tr> </tbody> </table>			Predicted: Not Fraud		Predicted: Fraud		Actual: Not Fraud	True Negative (TN)	Actual: Fraud	False Positive (FP)	Actual: Not Fraud	965	8	5	True Negative (TN)	False Positive (FP)	Actual: Fraud	8	1022	1022	False Negative (FN)	True Positive (TP)		precision	recall	f1-score	support	Not Fraud	0.99	0.99	0.99	970	Fraud	0.99	0.98	0.98	1030	accuracy				0.99	macro avg	0.99	0.99	0.99	970	weighted avg	0.99	0.99	0.99	2000
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2	Tune the Model	<p>Hyperparameter Tuning – GridSearchCV used to optimize parameters (e.g., n_estimators, max_depth)</p> <p>Validation Method – Train/Test Split (80/20) with Cross-Validation (k-fold)</p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Rank</th> <th>Mean Test Score</th> <th>n_estimators</th> <th>max_depth</th> <th>max_features</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.9875</td> <td>150</td> <td>12</td> <td>sqrt</td> </tr> <tr> <td>2</td> <td>0.9867</td> <td>200</td> <td>12</td> <td>sqrt</td> </tr> <tr> <td>3</td> <td>0.9865</td> <td>100</td> <td>12</td> <td>sqrt</td> </tr> </tbody> </table> <p>Best parameters found: n_estimators: 150, max_depth: 12, max_features: sqrt</p> <p>Best parameters for GridSearchCV: n_estimators: 150, max_depth: 12, max_feature:sqrt</p>	Rank	Mean Test Score	n_estimators	max_depth	max_features	1	0.9875	150	12	sqrt	2	0.9867	200	12	sqrt	3	0.9865	100	12	sqrt																																
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