**Model Optimization Phase**

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| Date | 5 July 2025 |
| Team ID | SWTID1749620997 |
| Project Title | Online Payment Fraud Detection |
| Maximum Marks | 10 Marks |

**Model Optimization Phase**

The Model Optimization Phase involves refining machine learning models for peak performance. It includes comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

**Performance Metrics Comparison Report :**

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| **Model** | **Optimized Metric** |
| Random Forest Classifier |  |
| Decision Tree Classifier |  |
| Extra Trees Classifier |  |
| LinearSVC |  |
| XGBoost |  |

### Final Model Selection Justification :

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| --- | --- |
| **Final Model** | **Reasoning** |
| DecisionTree | The Decision Tree Classifier was selected as the final optimized model because it achieved the highest test accuracy (99.97%) and a high F1 score, outperforming other models like Random Forest, SVM, and XGBoost. It also provides interpretability, fast training, and performs well without extensive preprocessing, demonstrating strong generalization on the dataset. |