**Model Optimization and Tuning Phase Template**

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| Date | 15 July 2024 |
| Team ID | team-740137 |
| Project Title | Online Payments Fraud Detection |
| Maximum Marks | 10 Marks |

**Model Optimization and Tuning Phase**

The Model Optimization and Tuning Phase involves refining neural network models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

### Hyperparameter Tuning Documentation ( 6 Marks):

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| **Model** | **Tuned Hyperparameters** | **Optimal Values** |
| Random Forest Classifier | - | cs26 |
| Decision Trees Classifier | - | cs27 |
| Extra Trees Classifier | - | cs28 |
| SVM Classifier | - | cs29 |
| XGboost |  | cs31 |

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### Performance Metrics Comparison Report (2 Marks):

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| cs32 |

### Final Model Selection Justification (2 Marks):

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| **Final Model** | **Reasoning** |
| **Random Forest Classifier (RFC)** | Performs exceptionally well with perfect accuracy metrics (Train accuracy: 1.000, Test accuracy: 1.000). It demonstrates excellent predictive performance and generalization ability, making it a robust choice for detecting fraudulent transactions. |