

Model Optimization and Tuning Phase Template

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| Date | 5th July 2024 |
| Team ID | 739804 |
| Project Title | Cost Prediction of Acquiring a Customer. |
| Maximum Marks | 10 Marks |

Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining machine learning 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):

| Model | Tuned Hyperparameters | Optimal Values |
|-----------------------------|-----------------------|----------------|
| Random Forest | - | - |
| Decision Tree | - | - |
| Gradient Boosting Regressor | - | - |

Performance Metrics Comparison Report (2 Marks):

| Model | Baseline Metric | Optimized Metric |
|-------|-----------------|------------------|
|-------|-----------------|------------------|

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|-------------------|---|---|
| Random Forest | - | - |
| Decision Tree | - | - |
| Gradient Boosting | - | - |

Final Model Selection Justification (2 Marks):

| Final Model | Reasoning |
|--------------------|---|
| Random Forest | I chose the Random Forest model for the cost prediction of acquiring a customer due to its ability to handle large datasets with high dimensionality and its robustness against overfitting. The ensemble nature of Random Forest, which combines multiple decision trees, enhances predictive accuracy and provides reliable estimates by averaging the results. |