Model Optimization and Tuning Phase Template

Date	15 JULY 2024
Team ID	740014
Project Title	Optimizing Food Delivery Using ML
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

Model	Baseline Metric	Optimized Metric
Random Forest Regressor	Baseline value	Optimized value

	Baseline value	Optimized value
XG Boost Regressor	Baseline value	Optimized value
Decision tree regressor	Baseline value	Optimized value
KNN	Baseline value	Optimized value

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 Regressor	n_estimators, max_depth, min_samples_split	-
XG Boost Regressor	learning_rate, n_estimators, max_depth	-
Decision tree regressor	A non-parametric model that predicts target values by learning decision rules from features.	-
KNN	A simple, instance-based learning algorithm that predicts based on the closest training examples.	-

Performance Metrics Comparison Report (2 Marks):

Random Forest Regressor	Baseline value	Optimized value

XG Boost Regressor	Baseline value	Optimized value

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
XG Boost Regressor	Gradient Boosting Regressor was selected as the final optimized model due to its superior performance in optimizing delivery times and customer satisfaction. It achieved a higher optimized metric compared to other models, indicating better predictive accuracy and efficiency for our specific problem domain.