Model Optimization and Tuning Phase Template

Date	03 June 2024
Team ID	739676
Project Title	Harvesting Brilliance: A Taxanomic Tale of Pumpkin Seeds Varieties
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 model.	Number of trees (n_estimators), Maximum depth of trees (max_depth), etc.	n_estimators=100, max_depth=10
Support Vector Machine	Kernel type, Regularization parameter (C), etc.	Kernel='rbf', C=1.0.

Performance Metrics Comparison Report (2 Marks):

Model	Baseline Metric	Optimized Metric
Model 1	0.85	0.90

Model 2	0.75	0.82

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
GradientBoosting Classifier	This is a powerful machine learning technique that combines multiple weak models (often decision trees) into a single strong learner. It achieves this by training each new model to focus on the errors made by the previous ones, progressively improving the overall accuracy