Model Optimization and Tuning Phase Report

Date	10 July 2024
Team ID	739830
Project Title	Beyond The Veil Of Wellness: Machine Learning's Unique Journey In Animal Health Classification
Maximum Marks	10 Marks

Model Optimization and Tuning Phase:

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
Decision Tree	-	-
Random Forest	-	-
KNN	--	--
Logistic Regression	--	--

Performance Metrics Comparison Report (2 Marks):

Model	Optimized Metric
Decision Tree	--

Random Forest	--
Logistic Regression	--
KNN	--

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Random Forest	Random Forest is an ensemble learning method that constructs multiple decision trees during training and merges their results to improve accuracy and control over-fitting. It works by averaging the predictions of multiple trees, which reduces variance and improves generalization. Each tree is trained on a bootstrap sample of the data and uses a random subset of features, enhancing robustness and performance on various datasets. Random Forests are widely used for their high accuracy, ability to handle large datasets with higher dimensionality, and resilience to overfitting.