Model Optimization and Tuning Phase Report

Date	15 july 2024
Team ID	739756
Project Title	Unveiling baldness: Genetic and environmental dynamics
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
Decision Tree	------	-----

Logistic Regression	-----	------
Ada Boost	--------	------
Random Forest	-----	----

Performance Metrics Comparison Report (2 Marks):

Model	Optimized Metric

Decision Tree	Train Result: == 92.86000260325406 Test Result: == 53.0 Classification Report: 　　　　　　precision　　recall　f1-score　support 　　　　0　　0.54　　0.49　　0.52　　102 　　　　1　　0.52　　0.57　　0.54　　98 　accuracy　　　　　　　　0.53　　200 　macro avg　　0.53　　0.53　　0.53　　200 weighted avg　　0.53　　0.53　　0.53　　200 confusion matrix: [[50 52] [42 56]]

Logistic Regression	Train Result: == 53.066332916145186 Test Result: == 57.499999999999999 Classification Report: 　　　　　　precision　　recall　f1-score　support 　　　　0　　0.58　　0.58　　0.58　　102 　　　　1　　0.57　　0.57　　0.57　　98 　accuracy　　　　　　　　0.57　　200 　macro avg　　0.57　　0.57　　0.57　　200 weighted avg　　0.58　　0.57　　0.58　　200 confussion matrix: [[59 43] [42 56]]

KNN	-------
Ada Boosting	-----

Support vector machine	-------

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Support vector machine	The Support vector machine was selected for its superior performance exhibiting . Its ability to handle complex relationships, minimize overfitting, and optimize predictive accuracy aligns with project objectives, justifying its selection as the final model.