

Model Optimization and Tuning Phase Template

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Team ID	SWTID1720112707
Project Title	Anemia Sense: Leveraging Machine Learning For Precise Anemia Recognitions
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
Logistic Regression	No hyperparameter tuning	Default values
Random Forest	No hyperparameter tuning	Default values
Decision Tree	No hyperparameter tuning	Default values
Naive Bayes	No hyperparameter tuning	Default values
SVM	No hyperparameter tuning	Default values
Gradient Boosting	No hyperparameter tuning	Default values

Performance Metrics Comparison Report (2 Marks):

Model	Baseline Metric (Accuracy)	Optimized Metric (Accuracy)
Logistic Regression	0.99	0.99
Random Forest	1.00	1.00
Decision Tree	1.00	1.00
Naive Bayes	0.97	0.97
SVM	0.99	0.99
Gradient Boosting	1.00	1.00

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Random Forest	The Random Forest model was chosen as the final optimized model due to its perfect accuracy score of 1.0. This indicates its superior performance in correctly classifying all instances in the dataset. The Random Forest model is also highly robust, capable of handling both linear and non-linear relationships, and provides better generalization compared to other models. Additionally, it is less prone to overfitting due to its ensemble nature, ensuring consistent and reliable predictions for anemia detection.