Model Optimization and Tuning Phase Report

Date	21 June 2024
Team ID	739832
Project Title	Startup Prophet
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 Model	-	-

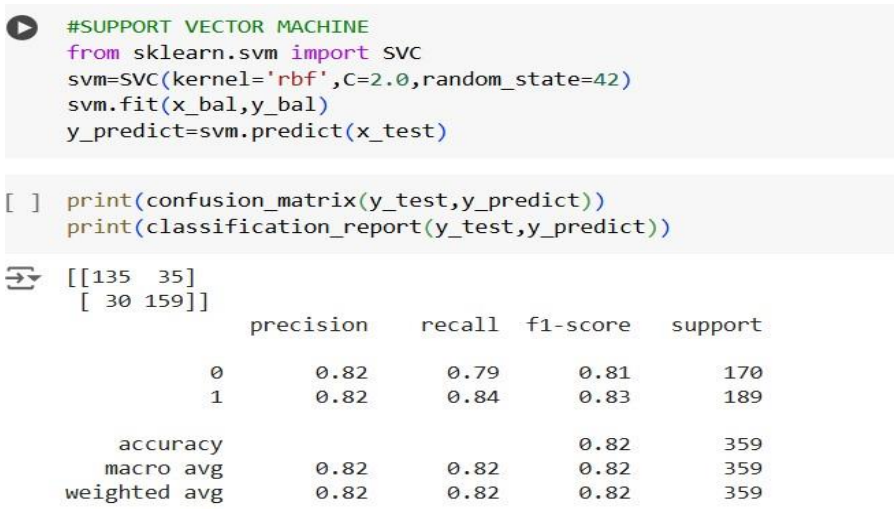
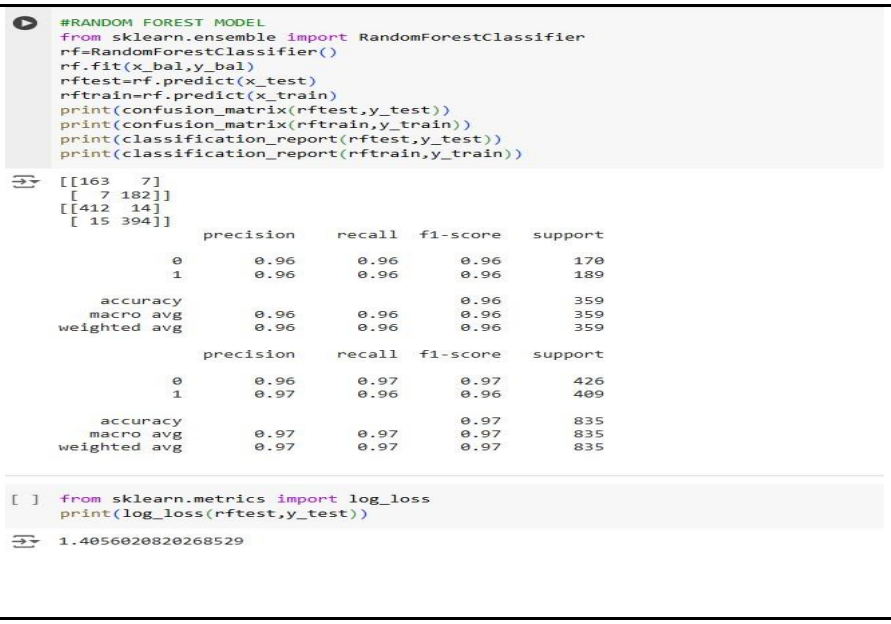
Support Vector Machine	-	-

Random Forest Model	-	-

Performance Metrics Comparison Report (2 Marks):

Model	Optimized Metric

Logistic Regression Model	`[ ]` `#LOGISTIC REGRESSION`
	`from sklearn.linear_model import LogisticRegression`
	`lr=LogisticRegression()`
	`lr.fit(x_bal,y_bal)`
	`y_pred=lr.predict(x_test)`
	
	`from sklearn.metrics import confusion_matrix,accuracy_score,classification_report`
	`print(confusion_matrix(y_test,y_pred))`
	`print(classification_report(y_test,y_pred))`
	
	`[[136 34]`
	` [ 56 133]]`
	`precision recall f1-score support`
	`0 0.71 0.80 0.75 170`
	`1 0.80 0.70 0.75 189`
	`accuracy 0.75 359`
	`macro avg 0.75 0.75 0.75 359`
	`weighted avg 0.75 0.75 0.75 359`
	
	`[ ]` `from sklearn.metrics import log_loss`
	`print(log_loss(y_test,y_pred))`
	
	`9.03601338445834`

Support Vector Machine	
Random Forest Model	

Final Model Selection Justification (2 Marks):

Final Model	Reasoning

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