Model Optimization and Tuning Phase Report

Date	15 July 2024
Team ID	740073
Project Title	Exploratory Analysis of Rain Fall Data in India for Agriculture
Maximum Marks	10 Marks

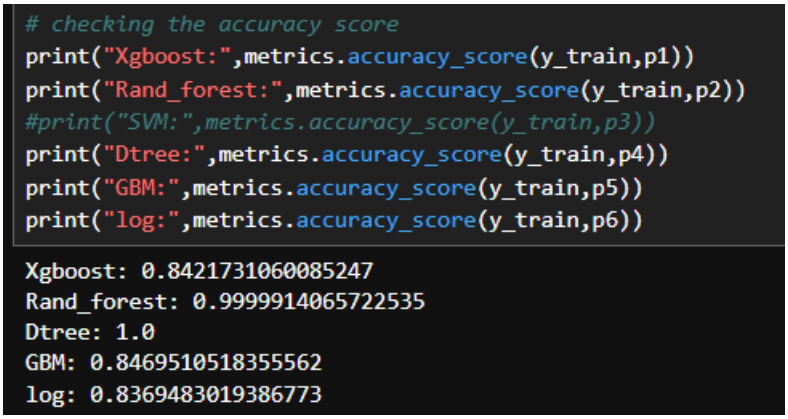
Model Optimization and Tuning Phase

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):

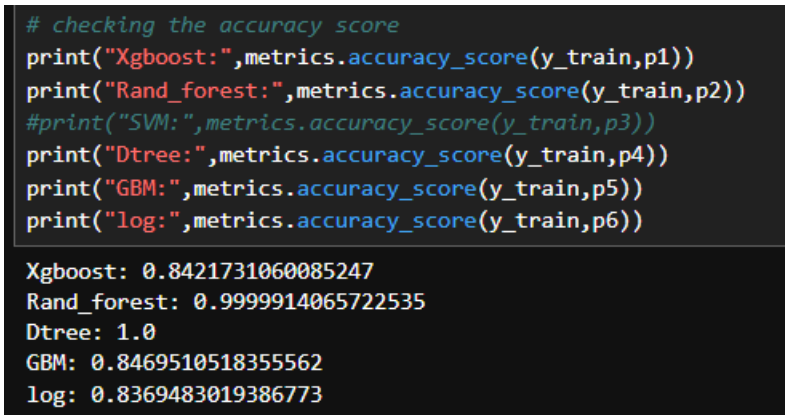
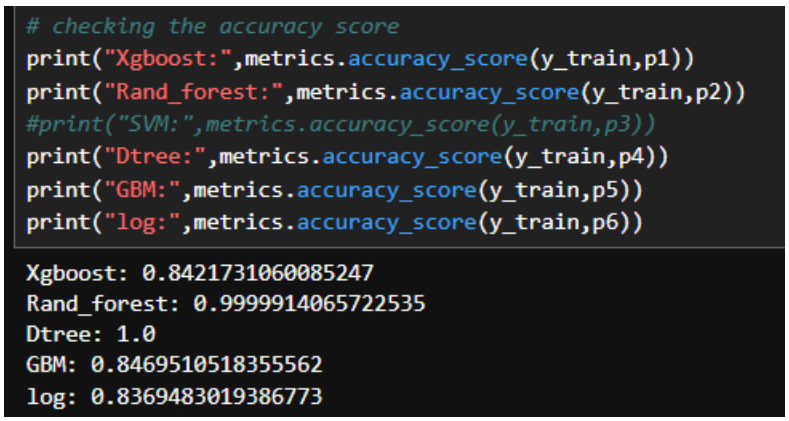
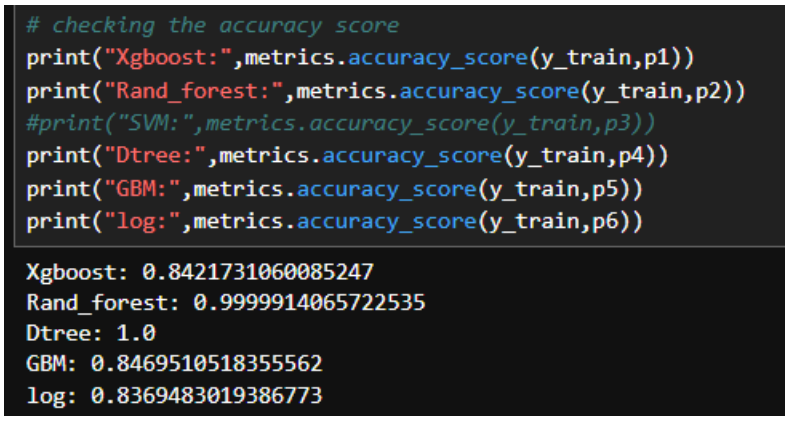
Model	Tuned Hyperparameters	Optimal Values
Decision Tree	-----	----
Random Forest	-----	----
Gradient Boosting	----	----

Performance Metrics Comparison Report (2 marks):

Model	Optimized Metric
Decision Tree	

```
# checking the accuracy score
print("Xgboost:",metrics.accuracy_score(y_train,p1))
print("Rand_forest:",metrics.accuracy_score(y_train,p2))
#print("SVM:",metrics.accuracy_score(y_train,p3))
print("Dtree:",metrics.accuracy_score(y_train,p4))
print("GBM:",metrics.accuracy_score(y_train,p5))
print("log:",metrics.accuracy_score(y_train,p6))
```

```
Xgboost: 0.8421731060085247
Rand_forest: 0.9999914065722535
Dtree: 1.0
GBM: 0.8469510518355562
log: 0.8369483019386773
```

Random Forest	
Log	
Gradient Boosting	

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Decision Tree	The Decision Tree model was selected for its superior performance, exhibiting high accuracy during hyperparameter tuning. Its ability to handle complex relationships, minimize overfitting, and optimize predictive accuracy aligns with project objectives, justifying its selection as the final model.