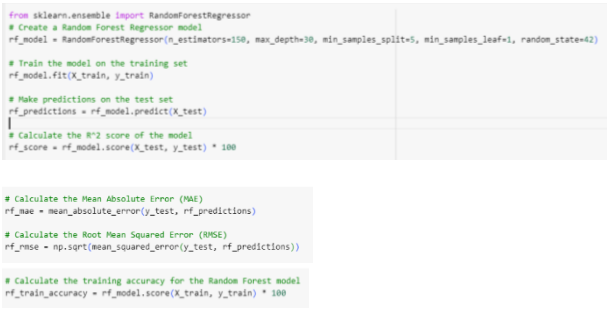
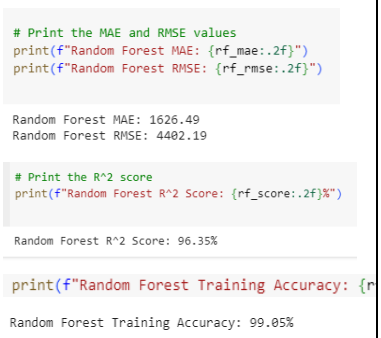
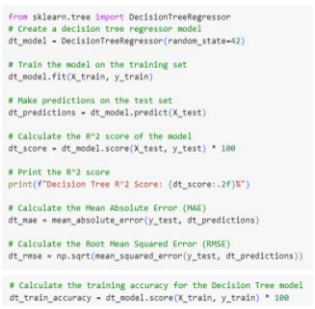
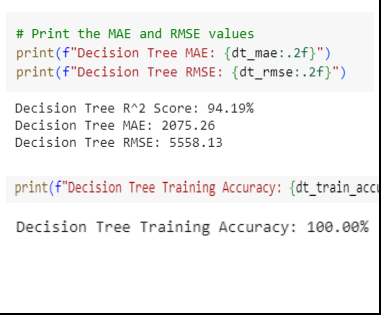
Model Optimization and Tuning Phase

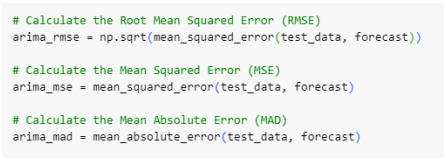
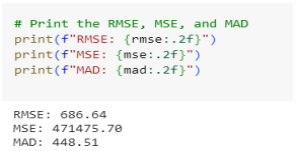
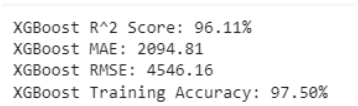
Date	23 March 2024
Team ID	738220
Project Title	Walmart Sales Analysis for Retail Industry with Machine Learning
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

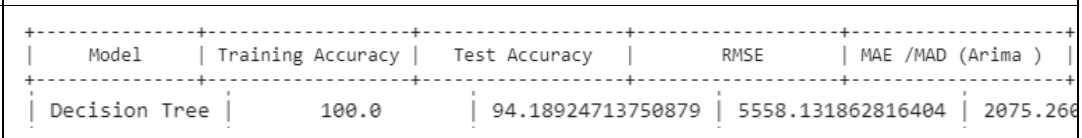
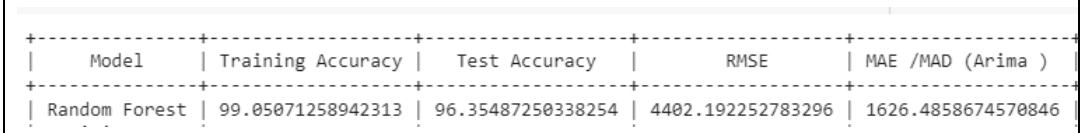
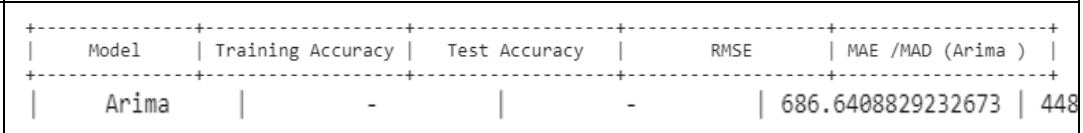
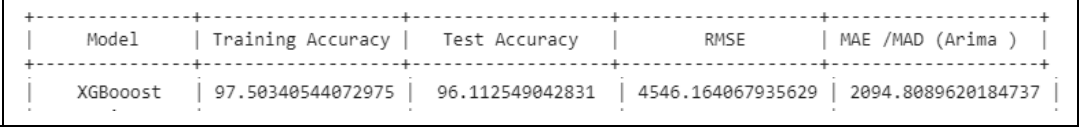
The Model Optimization and Tuning Phase involves refining machine learning models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

Hyperparameter Tuning Documentation:

Model	Tuned Hyperparameters	Optimal Values
Random Forest		
Decision Tree		

ARIMA		
XGBoost		

Performance Metrics Comparison Report :

Model	Optimized Metric
Decision Tree	
Random Forest	
ARIMA	
XGBoost	

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Random Forest	Both decision tree and random forest models achieved high accuracy, with decision tree reaching 100% accuracy and random forest achieving 99.05% accuracy. However, decision tree models often result in overfitting and high loss due to their complexity, whereas random forest models balance accuracy with reduced loss across different models. This suggests that random forest is the most effective model, as it maintains high accuracy while retaining the most useful information.