## Model Optimization and Tuning Phase Report

| | |
|---|---|
| **Date** | **10-july-2024** |
| **Team ID** | **739969** |
| **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.

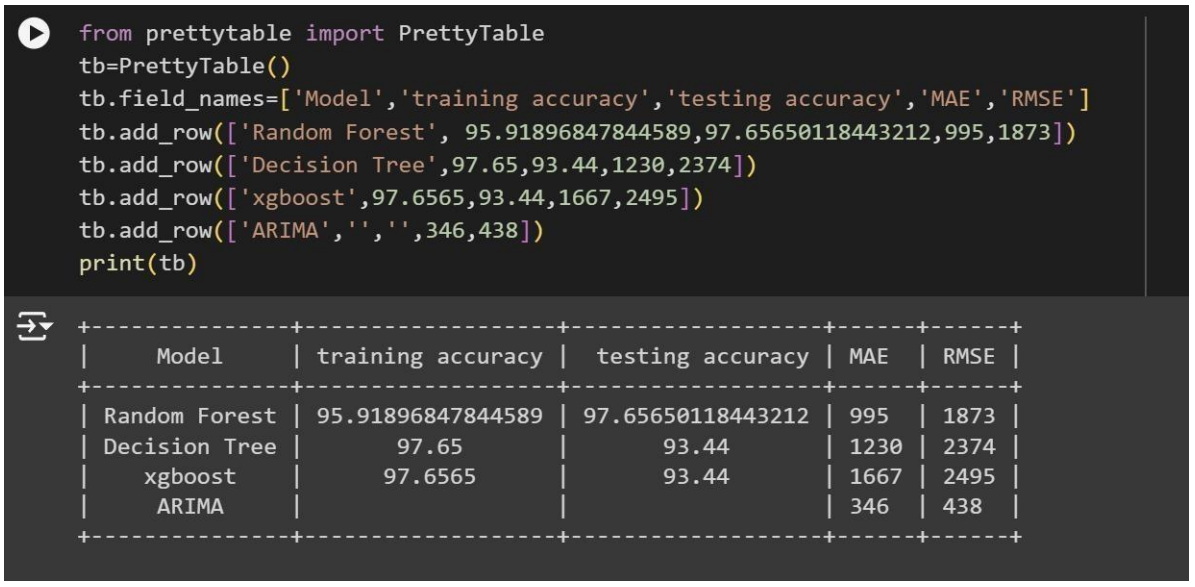
**Hyperparameter Tuning Documentation (6 Marks):**

| Model | Tuned Hyperparameters | Optimal Values |
|---|---|---|
| Decision Tree | - | - |
| Random Forest | - | - |
| Xgboost | - | - |
| ARIMA | - | - |

**Performance Metrics Comparison Report (2 Marks):**

| Model | Optimized Metric |
|---|---|
| Decision Tree | - |
| Random Forest | - |
| Xgboost | - |
| ARIMA | - |

**Final Model Selection Justification(2 Marks):**

| Final Model | Reasoning |
|---|---|
| Random Forest |  |

```
from prettytable import PrettyTable
tb=PrettyTable()
tb.field_names=['Model','training accuracy','testing accuracy','MAE','RMSE']
tb.add_row(['Random Forest', 95.91896847844589,97.65650118443212,995,1873])
tb.add_row(['Decision Tree',97.65,93.44,1230,2374])
tb.add_row(['xgboost',97.6565,93.44,1667,2495])
tb.add_row(['ARIMA','','',346,438])
print(tb)
```

```
+---------------+-------------------+-------------------+------+------+
|     Model     | training accuracy |  testing accuracy | MAE  | RMSE |
+---------------+-------------------+-------------------+------+------+
| Random Forest | 95.91896847844589 | 97.65650118443212 | 995  | 1873 |
| Decision Tree |       97.65       |       93.44       | 1230 | 2374 |
|    xgboost    |      97.6565      |       93.44       | 1667 | 2495 |
|     ARIMA     |                   |                   | 346  | 438  |
+---------------+-------------------+-------------------+------+------+
```