**Random Forest results, normal train, and test (80:20) split and validation on test data.**

**1.a) lag1 without hyperparameter tuning:**

Chart, line chart, histogram

Description automatically generated

Results of Random Forest model without tuning

MAPE :4.8837

MAE :1947.0733

RMSE :2403.9030

MSE :5778749.5914

r2 :0.9554

scaled\_rmse base: 0.0481

**1.b) lag1 after hyperparameter tuning:**

Chart, line chart

Description automatically generated

Results of XG boost model after tuning

MAPE :4.7875

MAE :1901.7241

RMSE :2345.6561

MSE :5502102.7668

r2 :0.9575

Scaled\_rmse tuned: 0.047

**2.a) Lag 3, no parameter tuning:**

Chart, line chart, histogram

Description automatically generated

Results of Random Forest model without tuning

MAPE :5.0006

MAE :1955.6586

RMSE :2419.9765

MSE :5856286.0538

r2 :0.9548

Scaled\_rmse base: 0.0484

**2.b) Lag3 with hyperparameter tuning**

Chart, line chart, histogram

Description automatically generated

Results of Random forest model after tuning

MAPE :4.8962

MAE :1908.4364

RMSE :2385.8283

MSE :5692176.4873

r2 :0.9560

Scaled RMSE tuned: 0.0478

**3.a) Lag7 no tuning:**

Chart, line chart, histogram

Description automatically generated

Results of Random Forest model without tuning

MAPE :5.8125

MAE :2312.0777

RMSE :2826.4613

MSE :7988883.3031

r2 :0.9383

scaled\_rmse base :0.0566

**3.b) Lag 7 with hyperparameter tuning:**

Chart, line chart

Description automatically generated

Results of Random forest model after tuning

MAPE :5.6272

MAE :2214.4480

RMSE :2717.5000

MSE :7384806.0273

r2 :0.9429

mean of test Y :42215.6181

max of test Y :67734.0400

min of test Y :17785.0900

scaled\_rmse tuned :0.0544

Summary table:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Normal training and test split validation (80% training and 20% testing) | | | | | | | | | |
| **lag** | **Algorithm** | **data transformation** | **hyperparameter tuning** | **MSE** | **RMSE** | **Scaled RMSE** | **MAE** | **MAPE** | **r2** |
| 1 | Random Forest | No | No | 5778749.591 | 2403.903 | 0.0481 | 1947.0733 | 4.8837 | 0.9554 |
| 1 | Random Forest Tuned | Yes | 5502102.767 | 2345.6561 | 0.047 | 1901.7241 | 4.7875 | 0.9575 |
| 3 | Random Forest | No | No | 5856286.054 | 2419.9765 | 0.0484 | 1955.6586 | 5.0006 | 0.9548 |
| 3 | Random Forest Tuned | Yes | 5692176.487 | 2385.8283 | 0.0478 | 1908.4364 | 4.8962 | 0.956 |
| 7 | Random Forest | No | No | 7988883.303 | 2826.4613 | 0.0566 | 2312.0777 | 5.8125 | 0.9383 |
| 7 | Random Forest Tuned | Yes | 7384806.027 | 2717.5 | 0.0544 | 2214.448 | 5.6272 | 0.9429 |

**Random forest model gave better results when hyperparameters are tuned for lag1.**

**RMSE is** 2345.6561 which is very less compared to mean of the target label(42215.6181).

Rmse\_scaled is 0.047 which is close to 0.

R2 is 0.9575.