Retail Giant Sales Forecasting

Analysis

21 Market Segments

There are total three market segments that are Consumer , Corporate and Home Office .

There are total seven market regions and those are US , APAC (Asia Pacific), Africa, Canada, EU , LATAM(Latin America).

Each of these regions forms a market-segment pair so we get 7 x 3 = 21 market segments.

Comparison showing the values for the coefficient of variation

From the table we can see that market-segment

Consumer-APAC has the lowest coefficient of

Variation. The low coefficient of variation shows that this market

Segment is the most consistent and profitable market segment.

0	Consumer-APAC	0.522725
7	Corporate-APAC	0.530051
4	Consumer-EU	0.595215
5	Consumer-LATAM	0.683770
11	Corporate-EU	0.722076
12	Corporate-LATAM	0.882177
18	Home Office-EU	0.938072
14	Home Office-APAC	1.008219
6	Consumer-US	1.010530
13	Corporate-US	1.071829
20	Home Office-US	1.124030
19	Home Office-LATAM	1.169693
2	Consumer-Canada	1.250315
1	Consumer-Africa	1.310351
9	Corporate-Canada	1.786025
8	Corporate-Africa	1.891744
15	Home Office-Africa	2.012937
16	Home Office-Canada	2.369695
3	Consumer-EMEA	2.652495
10	Corporate-EMEA	6.355024
17	Home Office-EMEA	7.732073

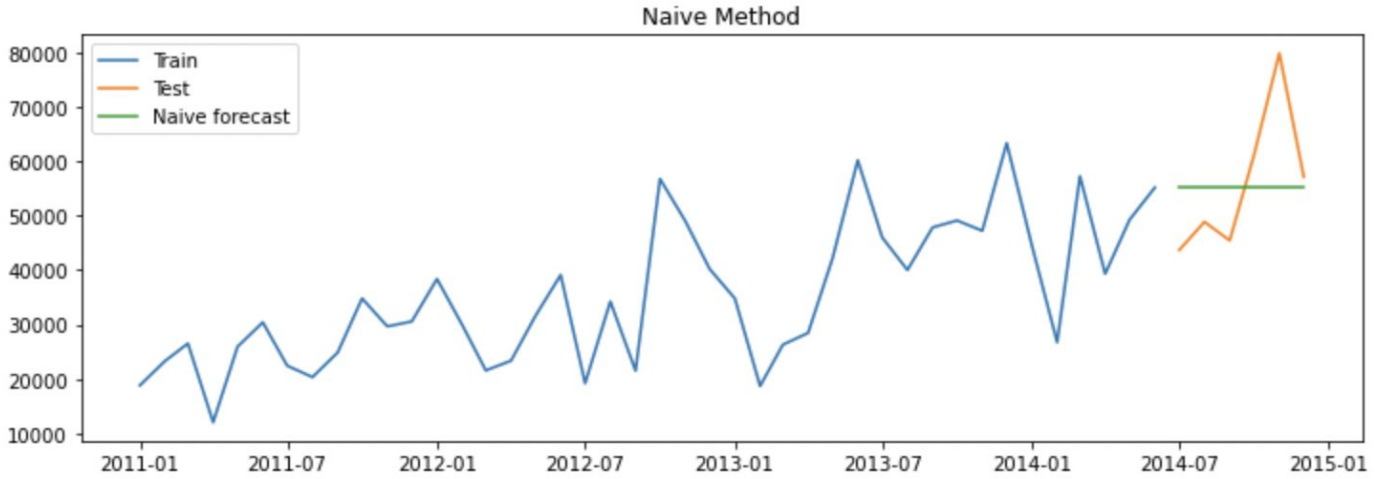
Why APAC-Consumer is the most profitable market segment?

Mean or Standard Deviation alone cannot tell us which market-segment pair makes the most profit because each of the market segment pairs have different values of sales volume and different attributes. The only way to find the most consistent market-segment pair is by the coefficient of variation(CoV). It is the ratio of standard deviation to the mean. A low coefficient of variation means low volatility and in turn, lesser risk on investment. Out of all the market segments, the APAC-Consumer market segment has the lowest CoV , therefore it is the least volatile market segment and hence, the most profitable market segment.

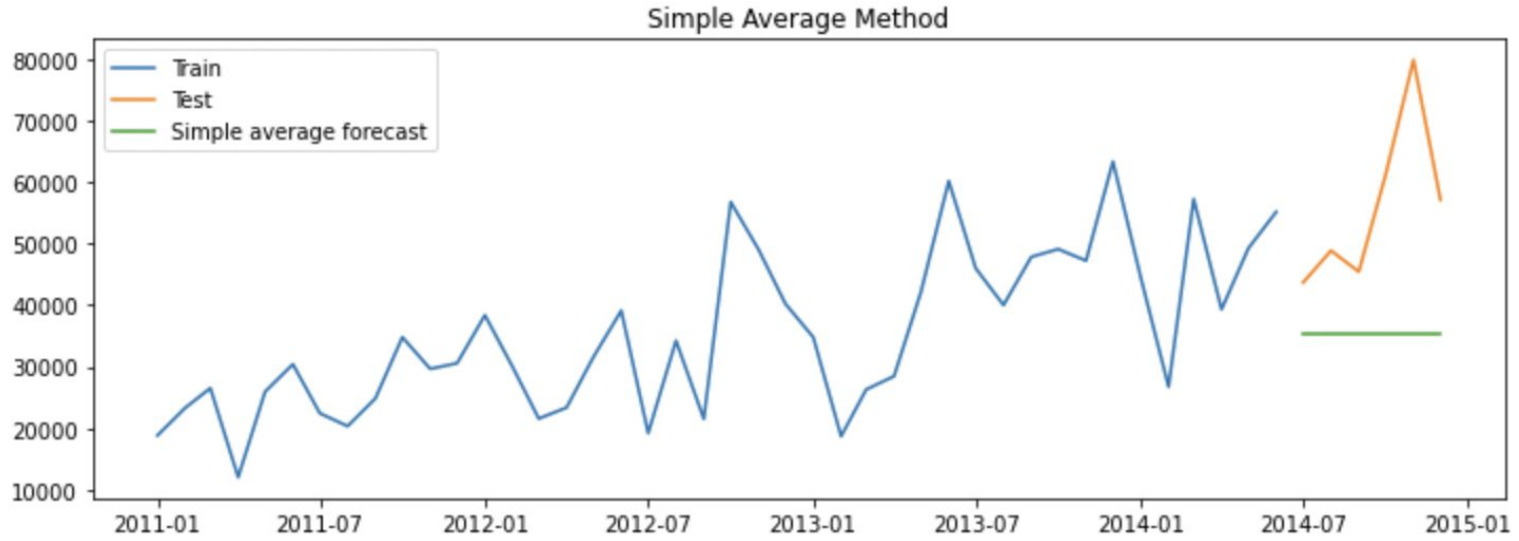
The optimum technique for the forecast

The optimum technique from the flow chart that would apply best for the prediction would be the **Holt Winter's Additive** Method from the smoothing techniques since the seasonality is present and is occurring after regular intervals of time. The model that can be used from the ARIMA techniques is the **SARIMA(Seasonal Auto Regressive Integrated Moving Average)** technique since the following technique takes into account the seasonality of the data which is present in our retail giant dataset.

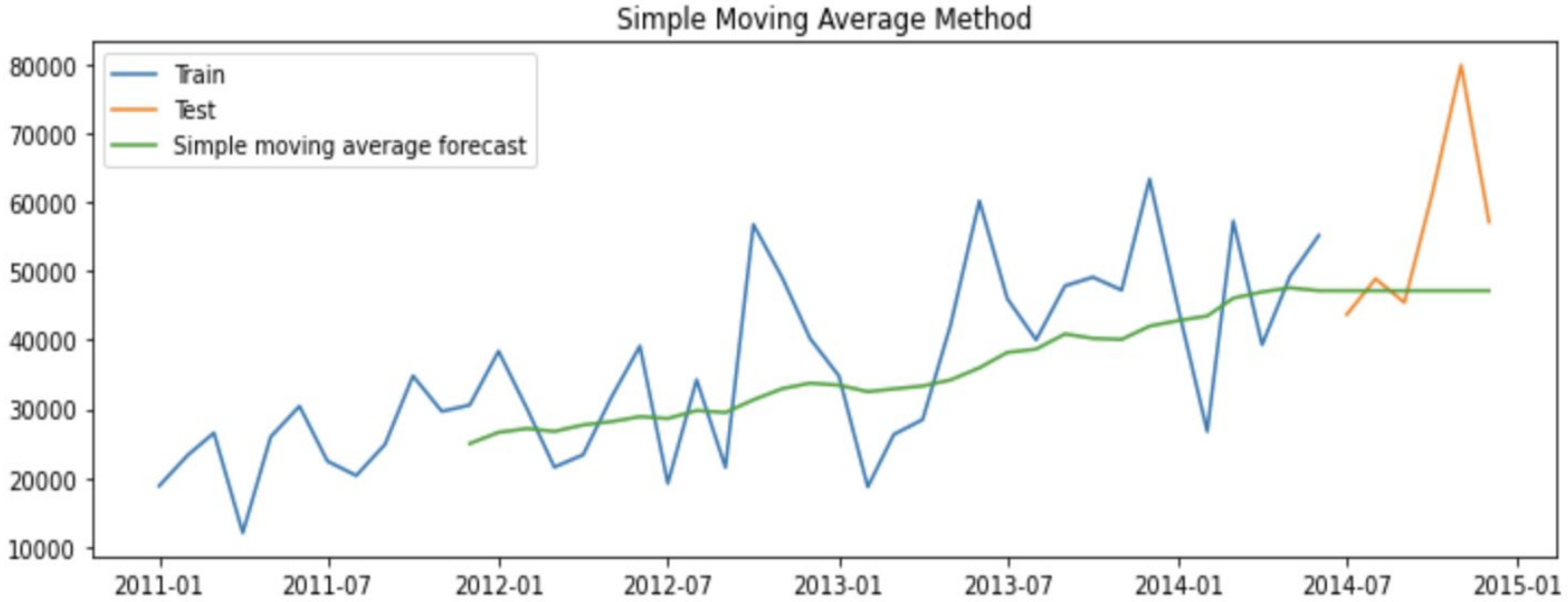
NAIVE METHOD : MAPE - 17.47



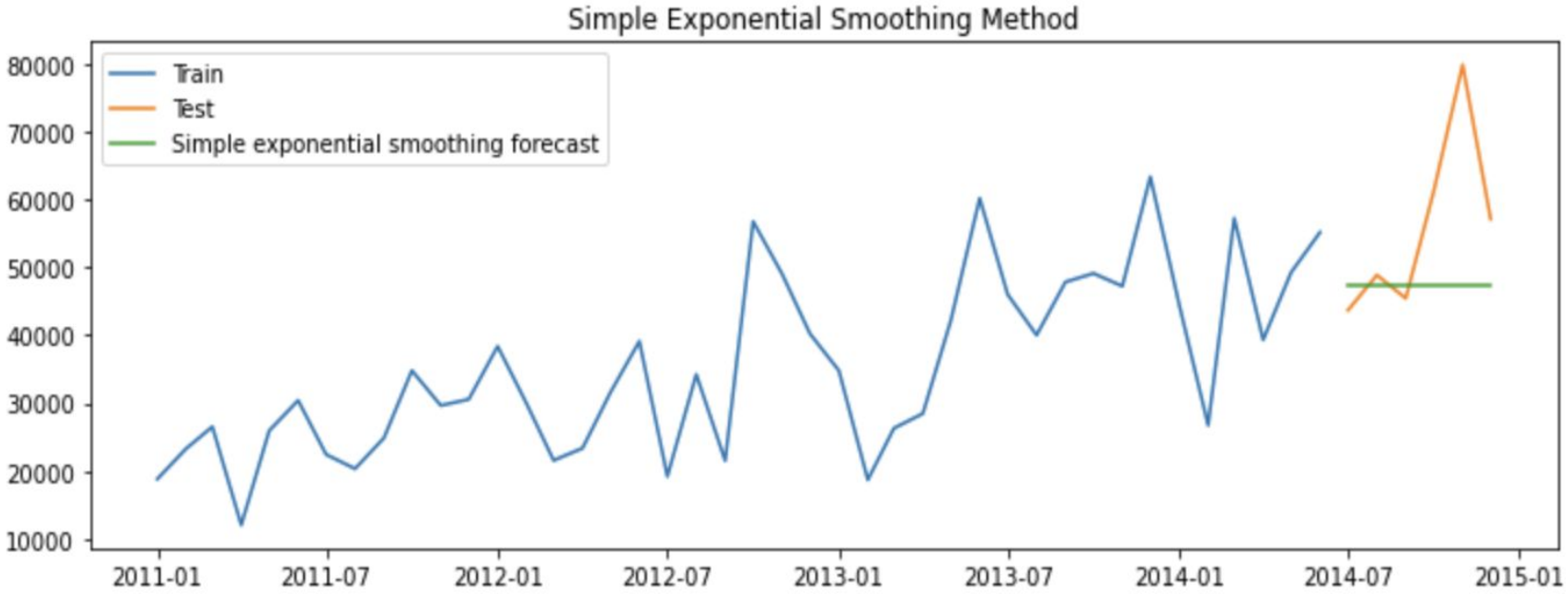
SIMPLE AVERAGE METHOD:MAPE -34.34



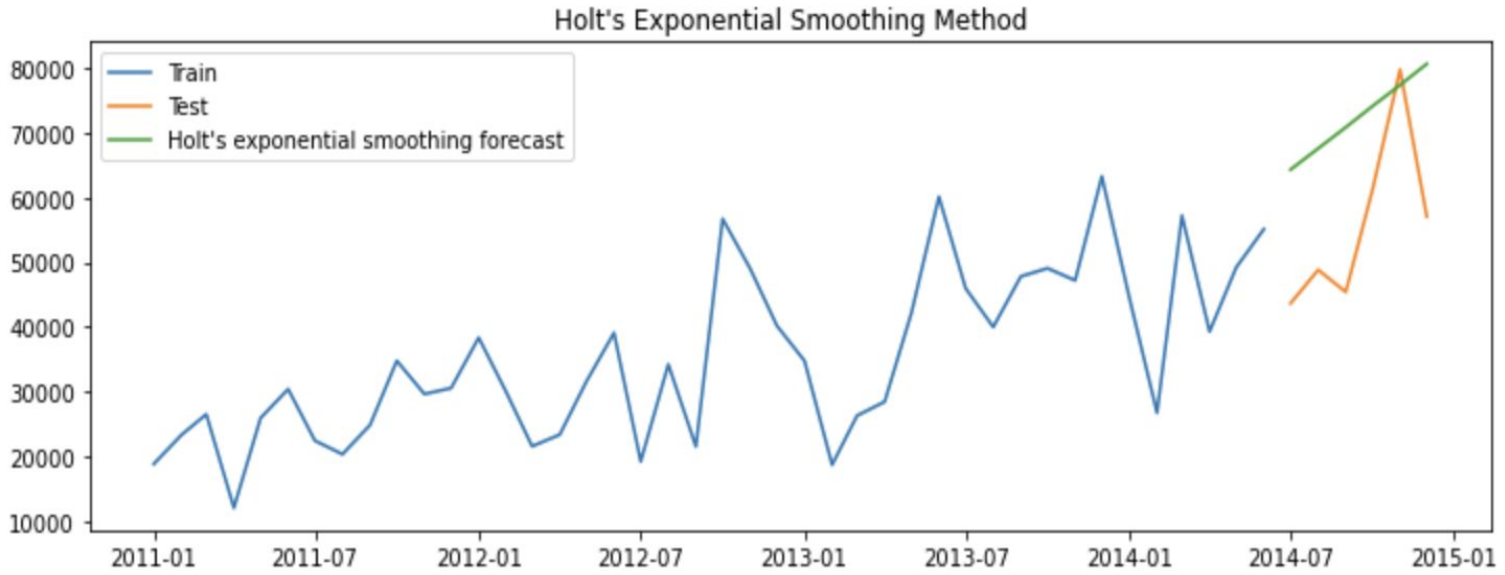
SIMPLE MOVING AVERAGE:MAPE-16.10



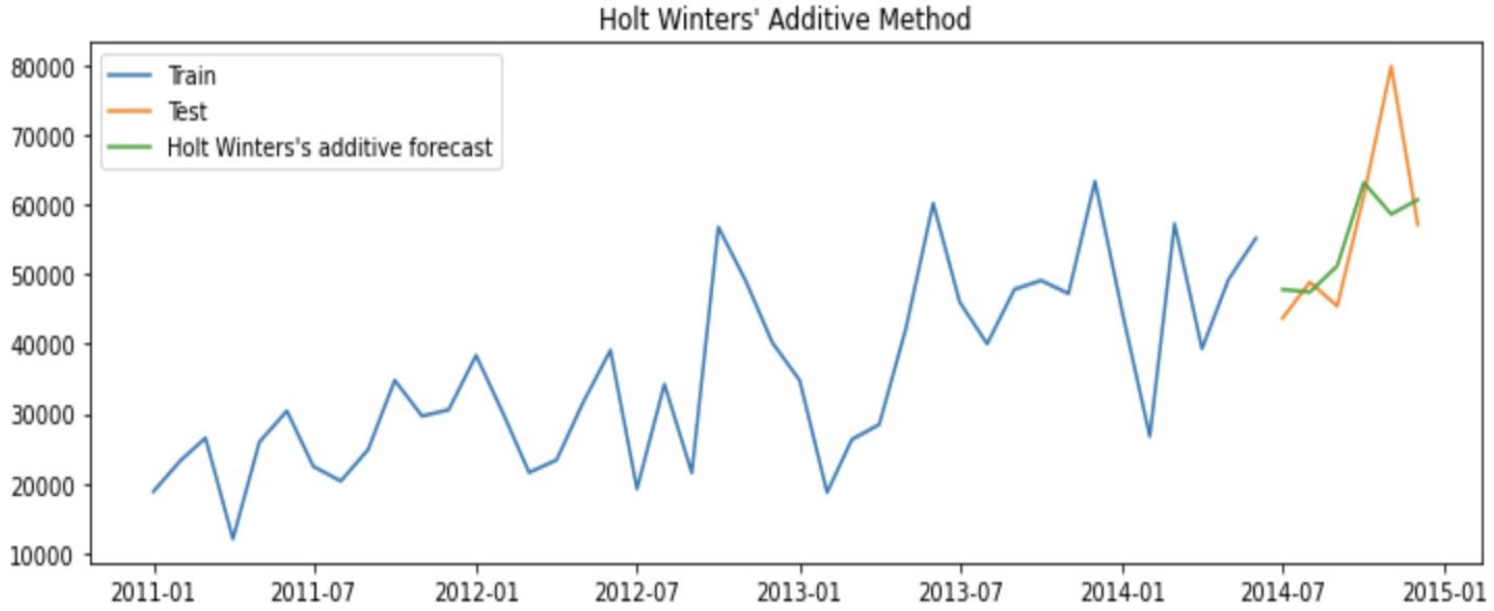
SIMPLE EXPONENTIAL SMOOTHING:MAPE-15.99



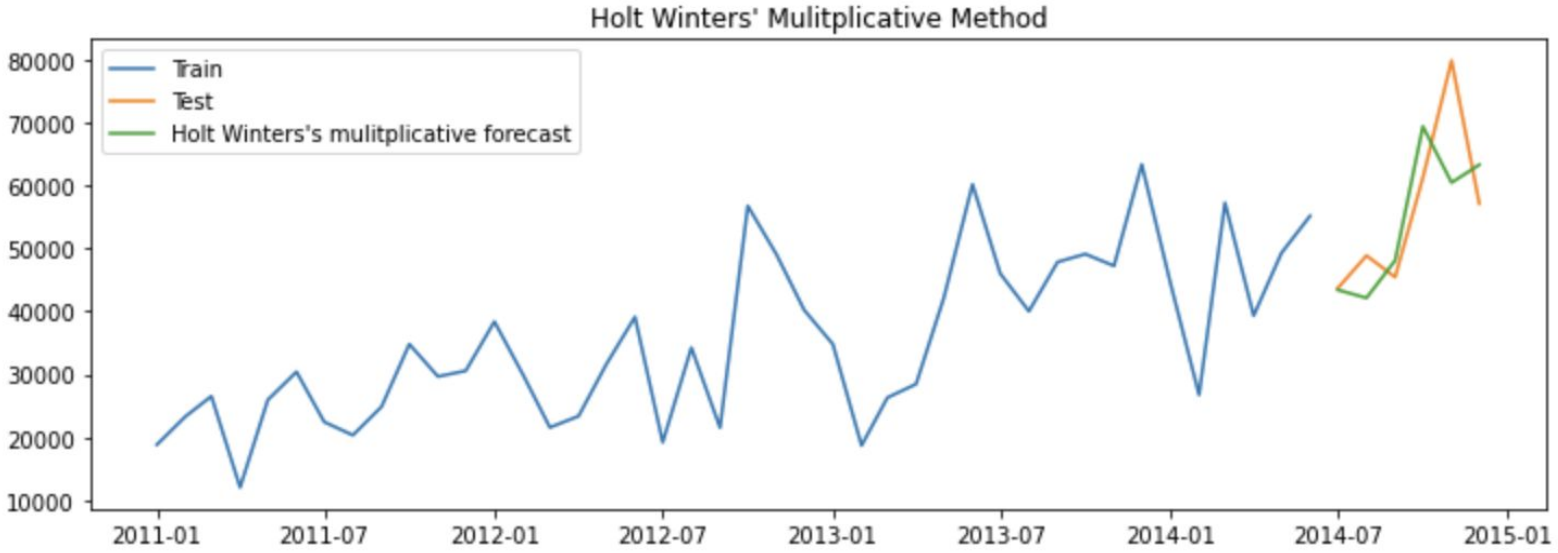
HOLT'S EXPONENTIAL SMOOTHING:MAPE-34.57



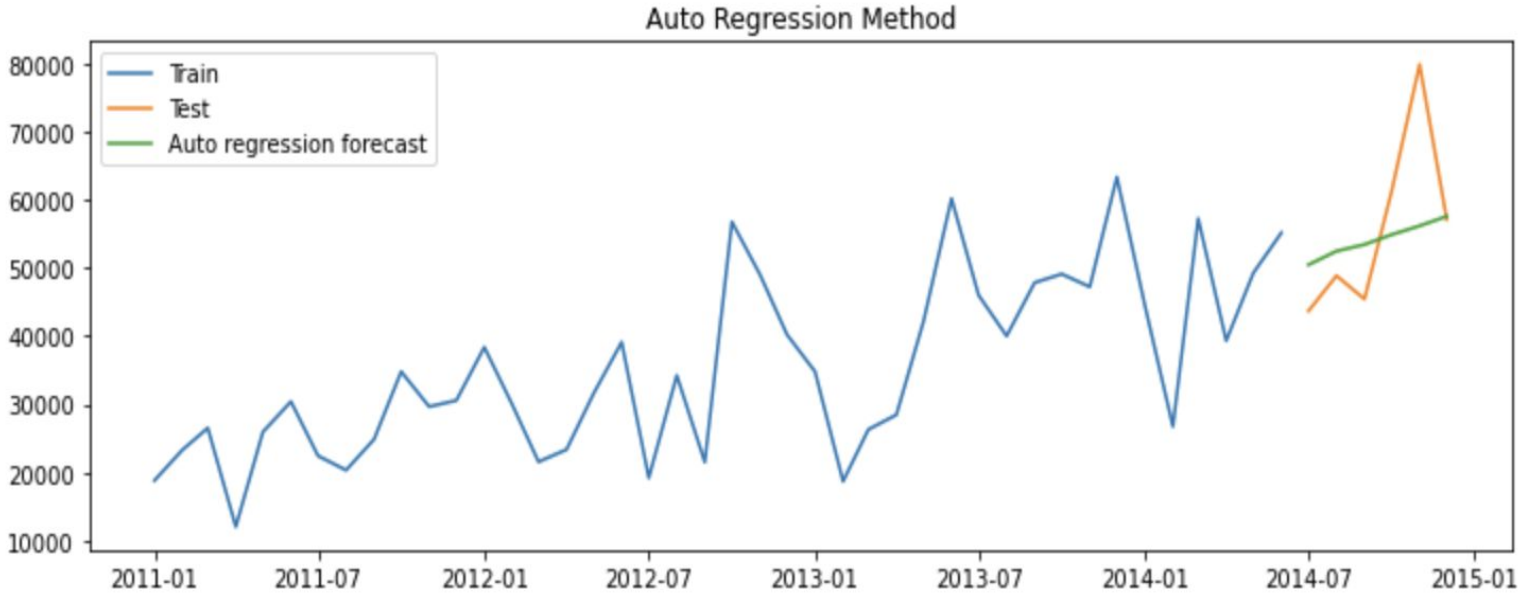
HOLT WINTER'S ADDITIVE: MAPE - 10.17



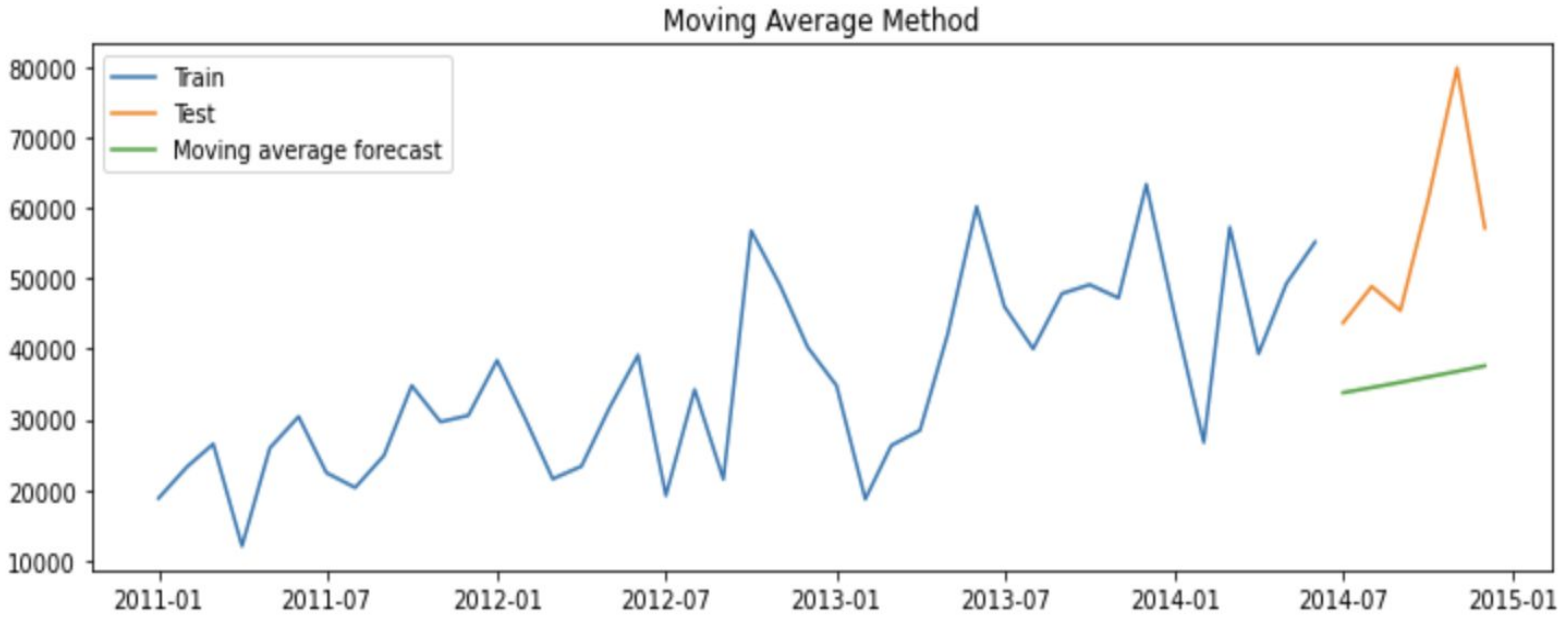
HOLT WINTER'S MULTIPLICATIVE: MAPE- 11.43



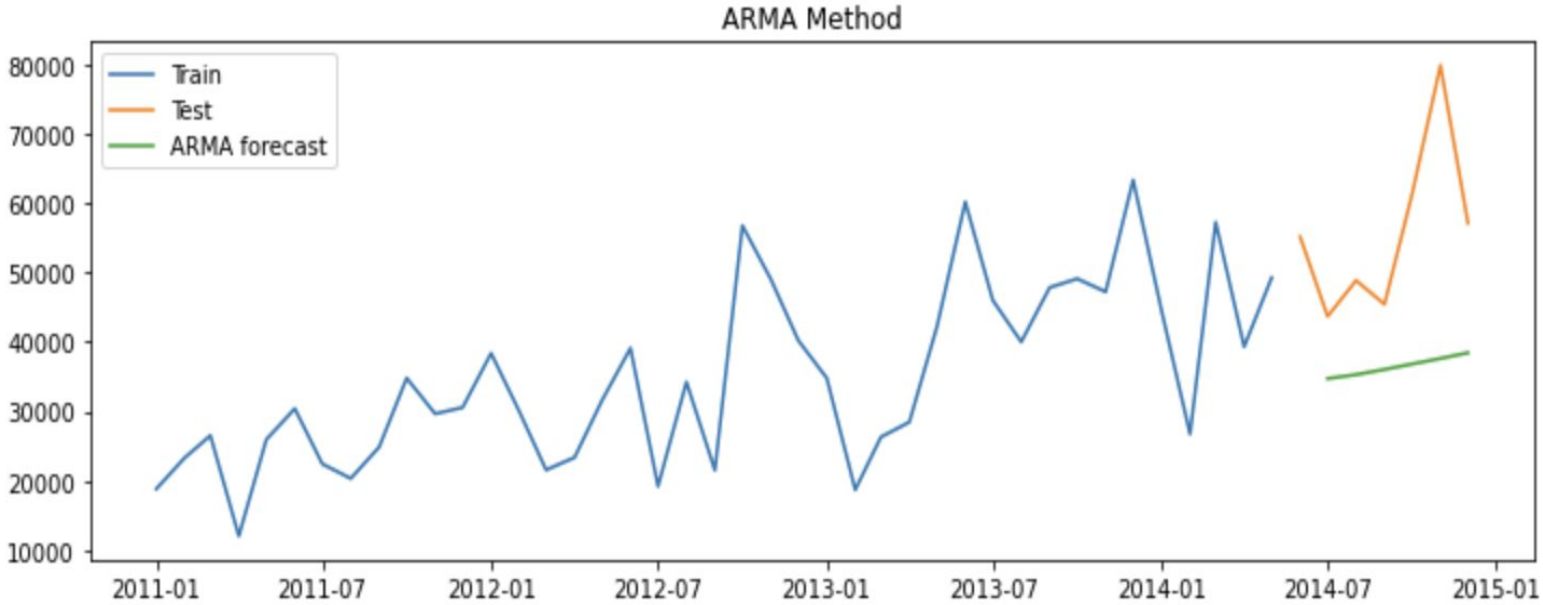
AUTO REGRESSIVE (AR): MAPE- 13.56



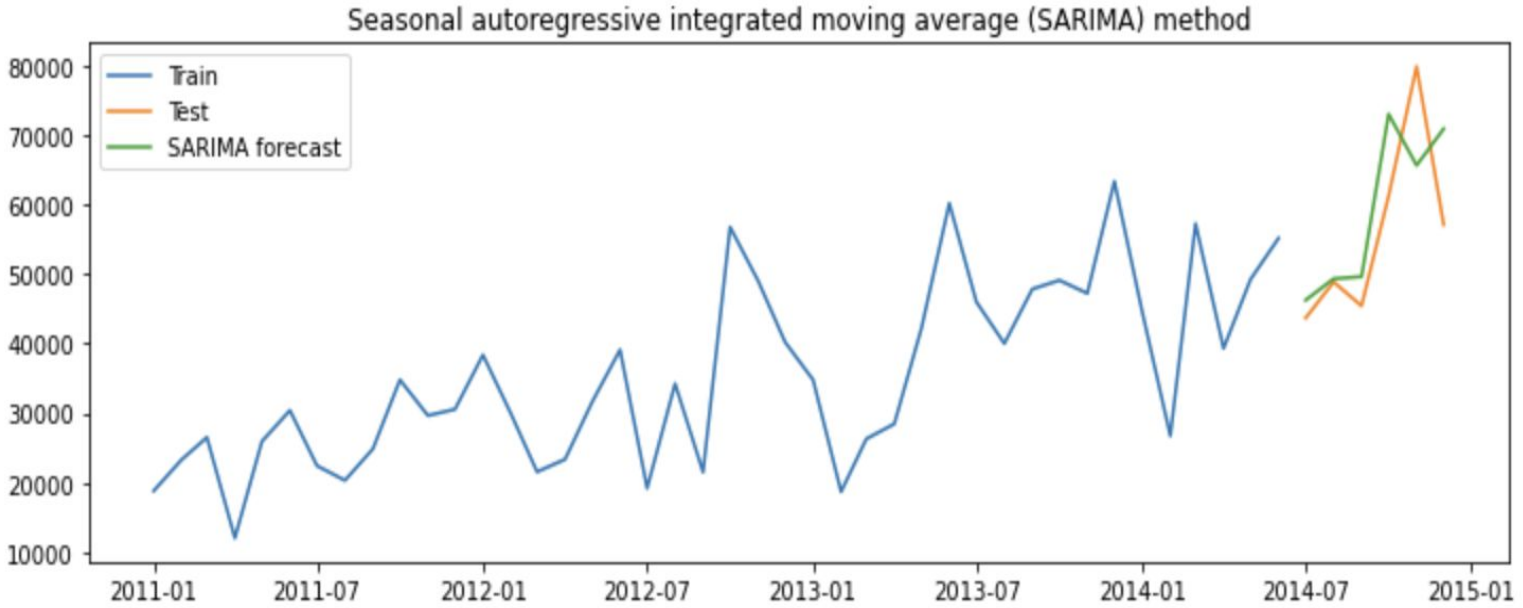
MOVING AVERAGE : MAPE - 33.93



AUTO REGRESSIVE MOVING AVERAGE (ARMA) : MAPE - 32.40



AUTO REGRESSIVE INTEGRATED MOVING AVERAGE (ARIMA): MAPE - 32.40



The best techniques for the forecast

The best techniques for the forecast as hypothesised earlier were **Holt Winter's Additive** method from the smoothing techniques and **SARIMA** method from the auto regressive techniques with **MAPE** values of **10.17** and **12.87** respectively. The additive Holt Winter's method proved to be more accurate as the **seasonality occurs after regular intervals of time**. While the SARIMA is accurate since it covers the **trend and seasonality** both which can be seen from the plot.