GLOBAL SUPERSTORES ASSIGNMENT

Submitted By

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1.What are the 21 market Segments?

2.Comparison showing the table of values for the coefficient of variation calculated on the profit for the 21 market segments.

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

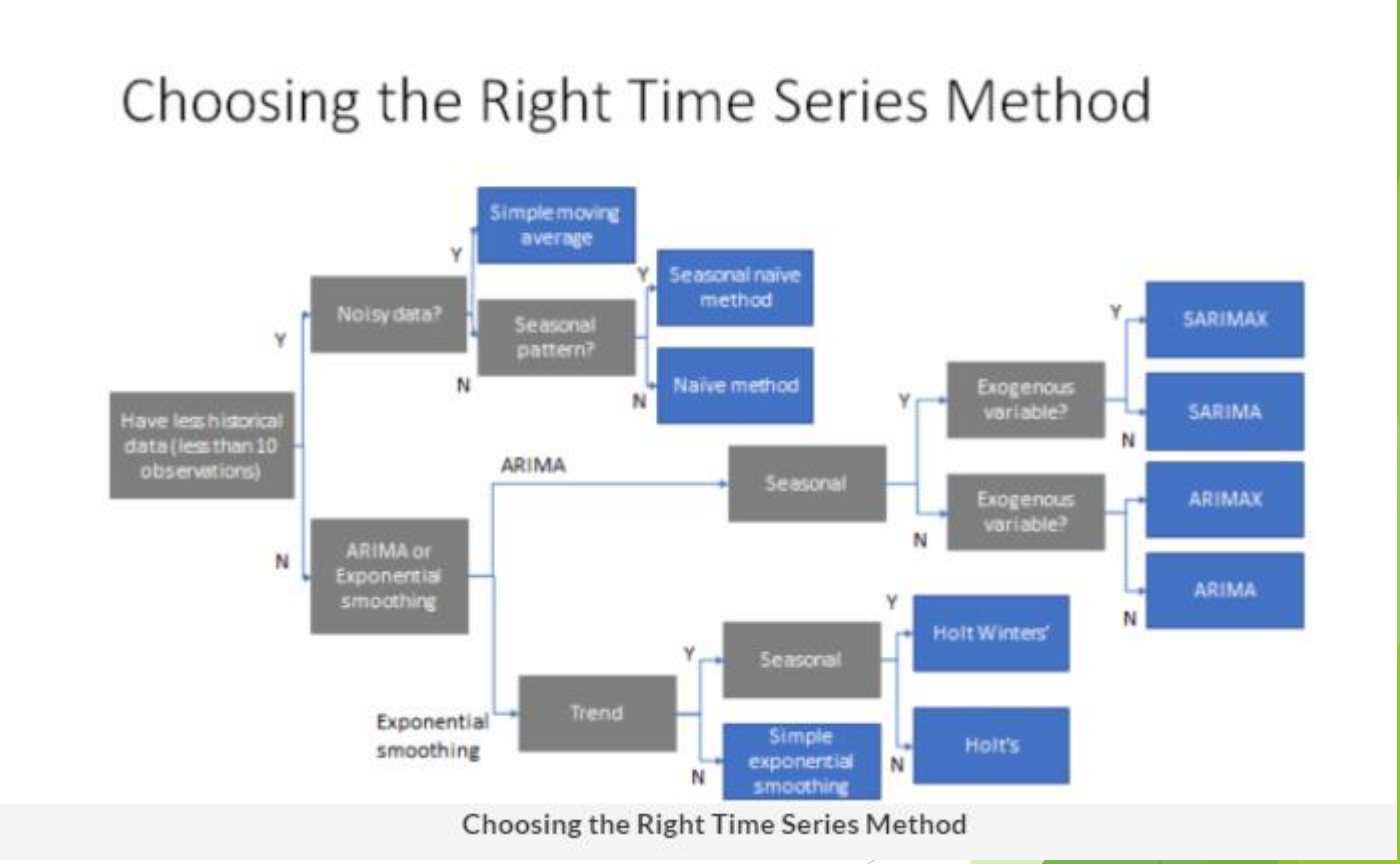
These are the 21 market segments with their corresponding COV(coefficient of variance) values.

3.**The reason why a market segment "APAC Consumer" is the most profitable market segment**

APAC Consumer is the market segment with the least coefficient of variation (cov) value that means least SD/ mean ratio.

4. Concluding the optimum technique from the flow chart that might work best for the sales forecast.

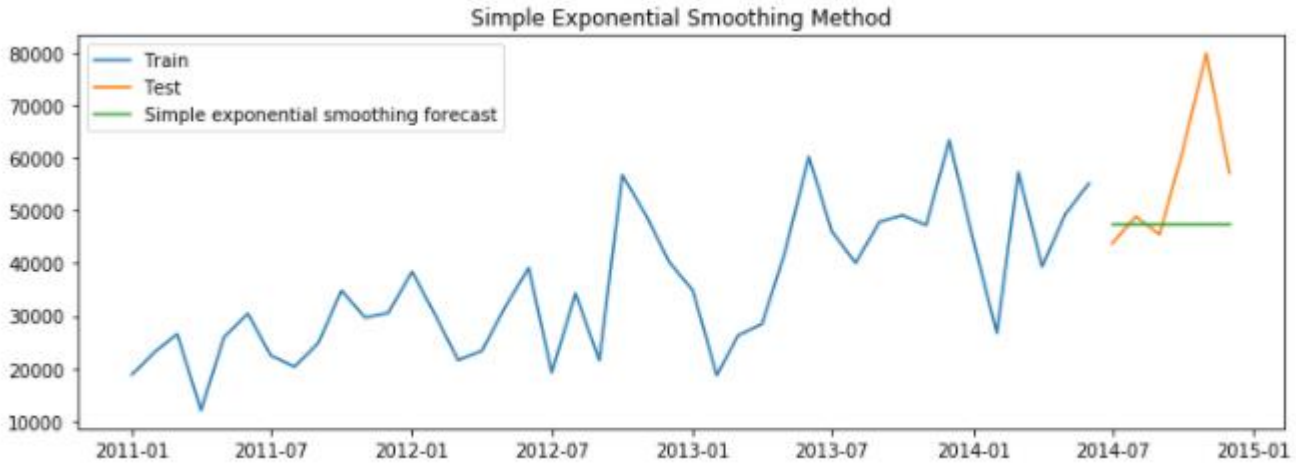
- Hypothesis : In exponential smoothening method the Holt-Winters' exponential smoothing technique and in ARIMA method SARIMAX method is predicted to be the best method. These are predicted since both this techniques cover both the trend and seasonality factors.

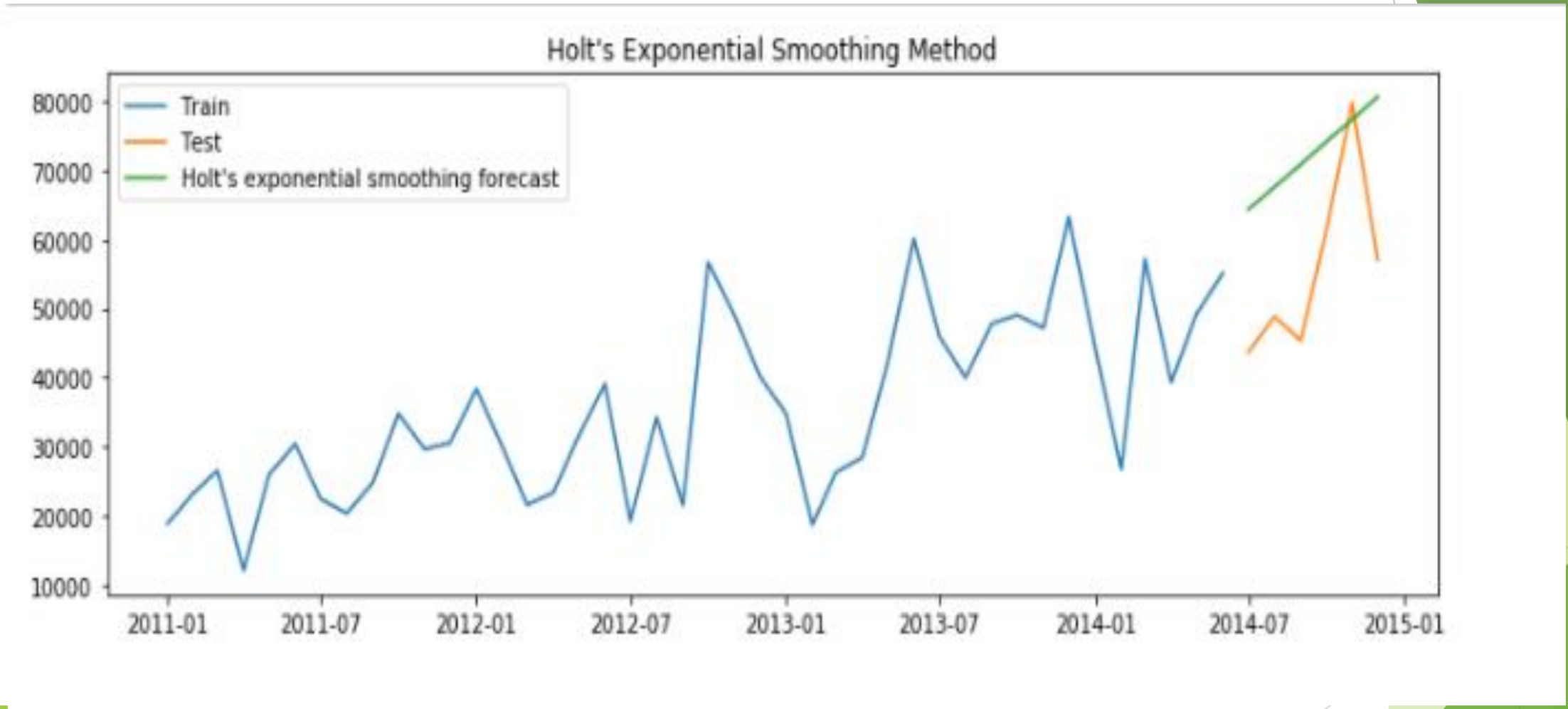


Choosing the Right Time Series Method

5.Comparing the sales forecast plots for all the smoothing techniques and their MAPE values.

simple exponential smoothening method




Holt's Exponential Smoothing Method
Train
Test
Holt's exponential smoothing forecast
80000
70000
60000
50000
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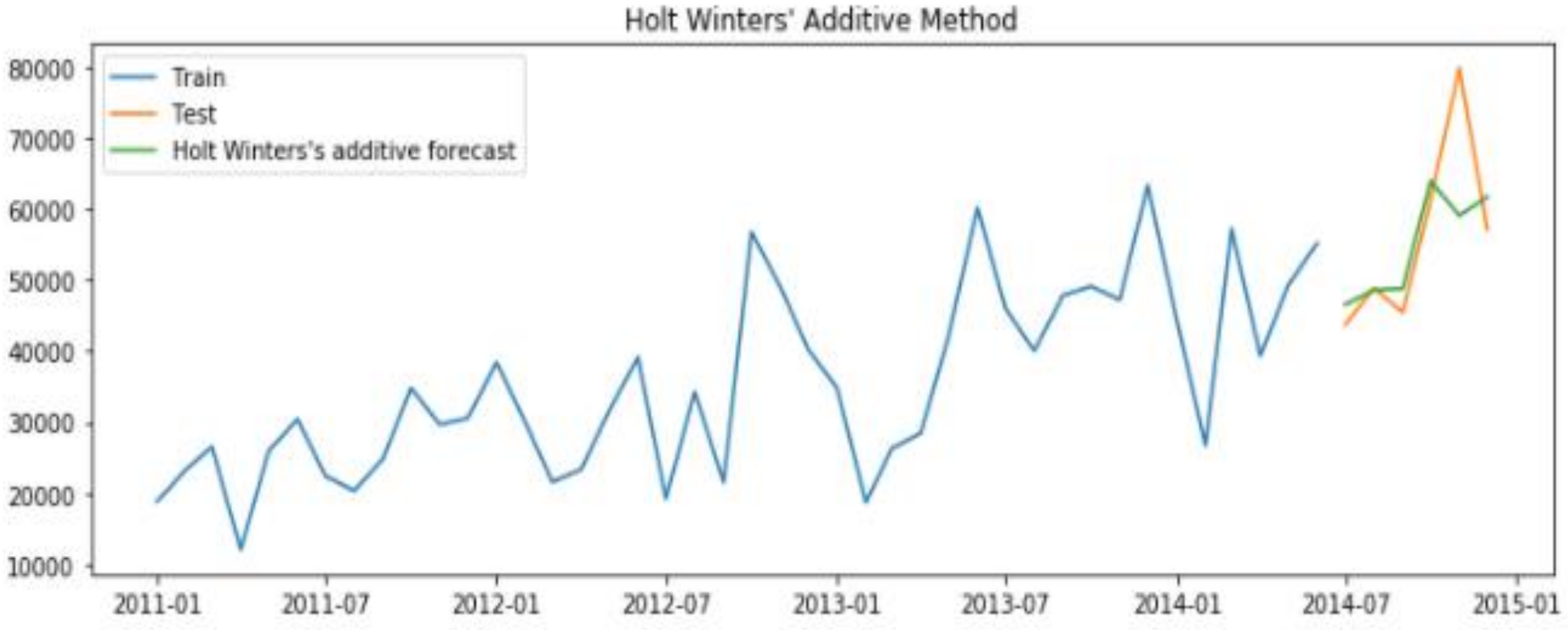
10000
2011-01
2011-07
2012-01
2012-07
2013-01
2013-07
2014-01
2014-07
2015-01


Holt Winters' Additive Method
Train
Test
Holt Winters's additive forecast
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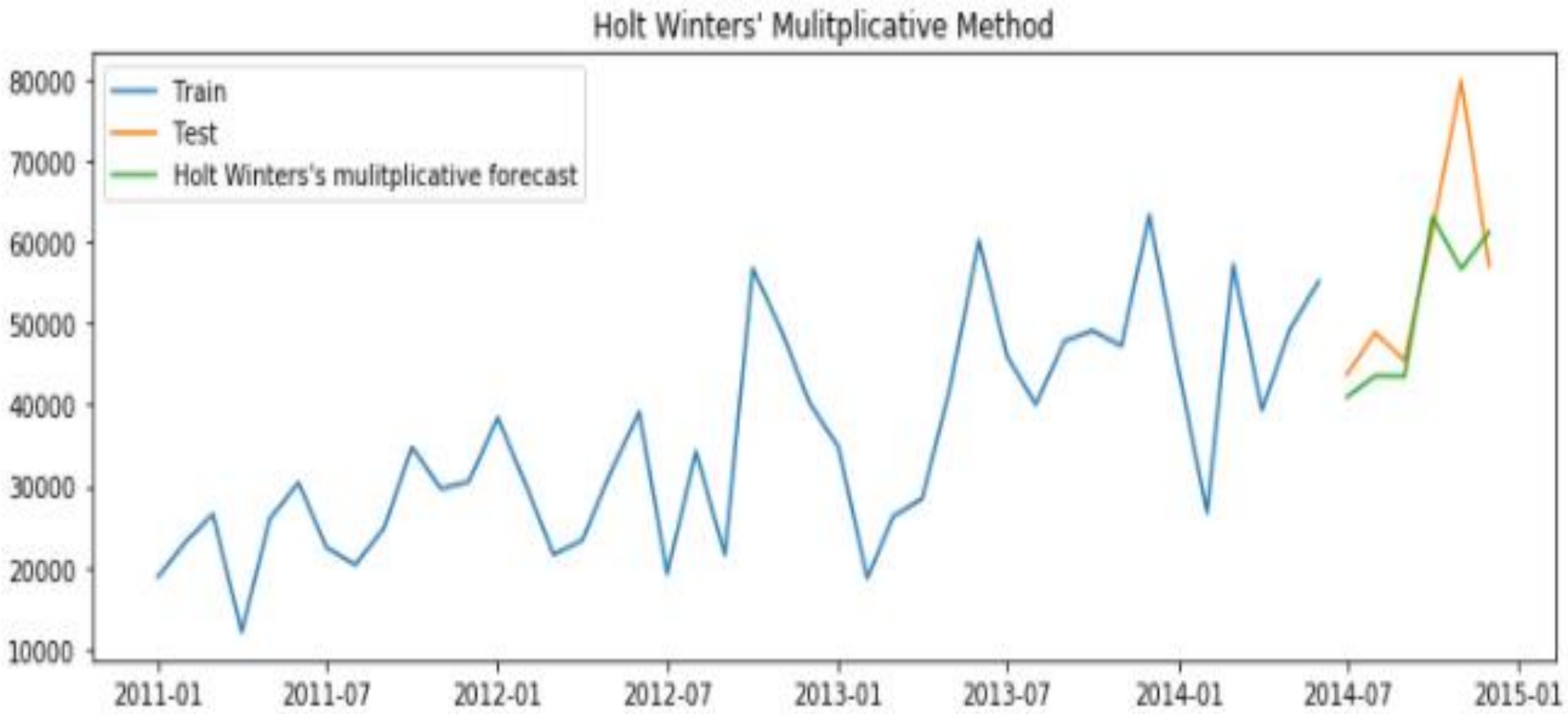
2015-01


Holt Winters' Mulitplicative Method
Train
Test
Holt Winters's mulitplicative forecast
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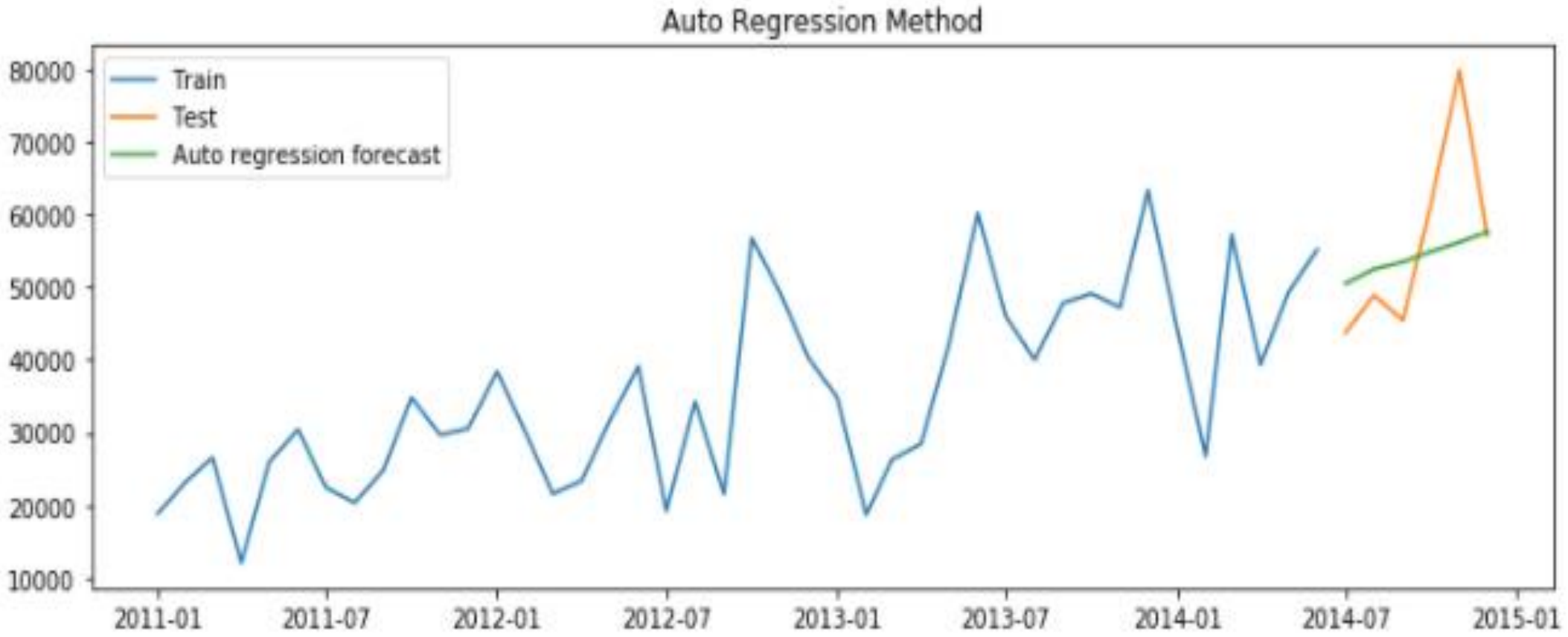
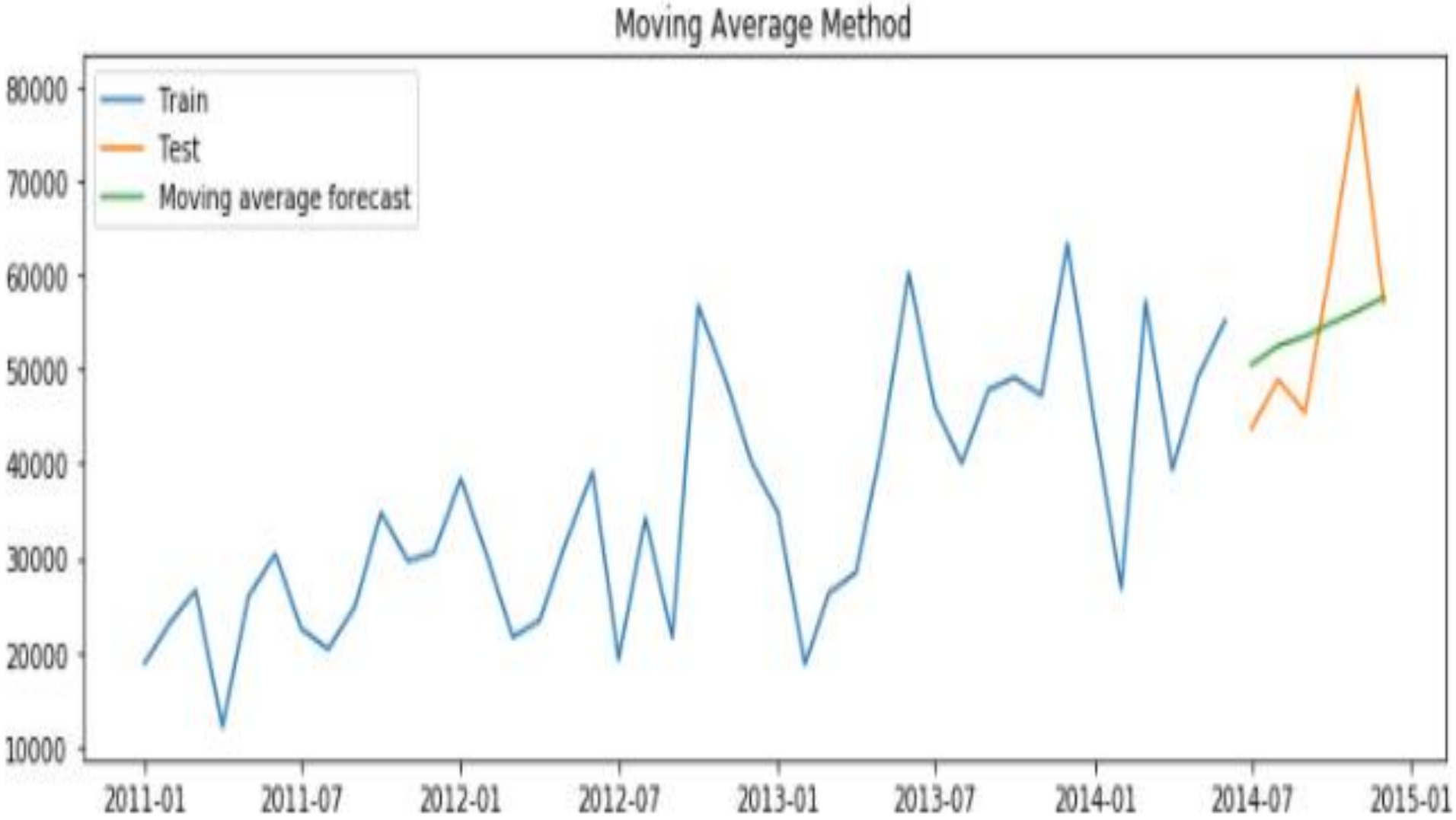
6.Comparing the sales forecast plots for all the ARIMA techniques and their MAPE values.




Moving Average Method
Train
Test
Moving average forecast
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2011-07
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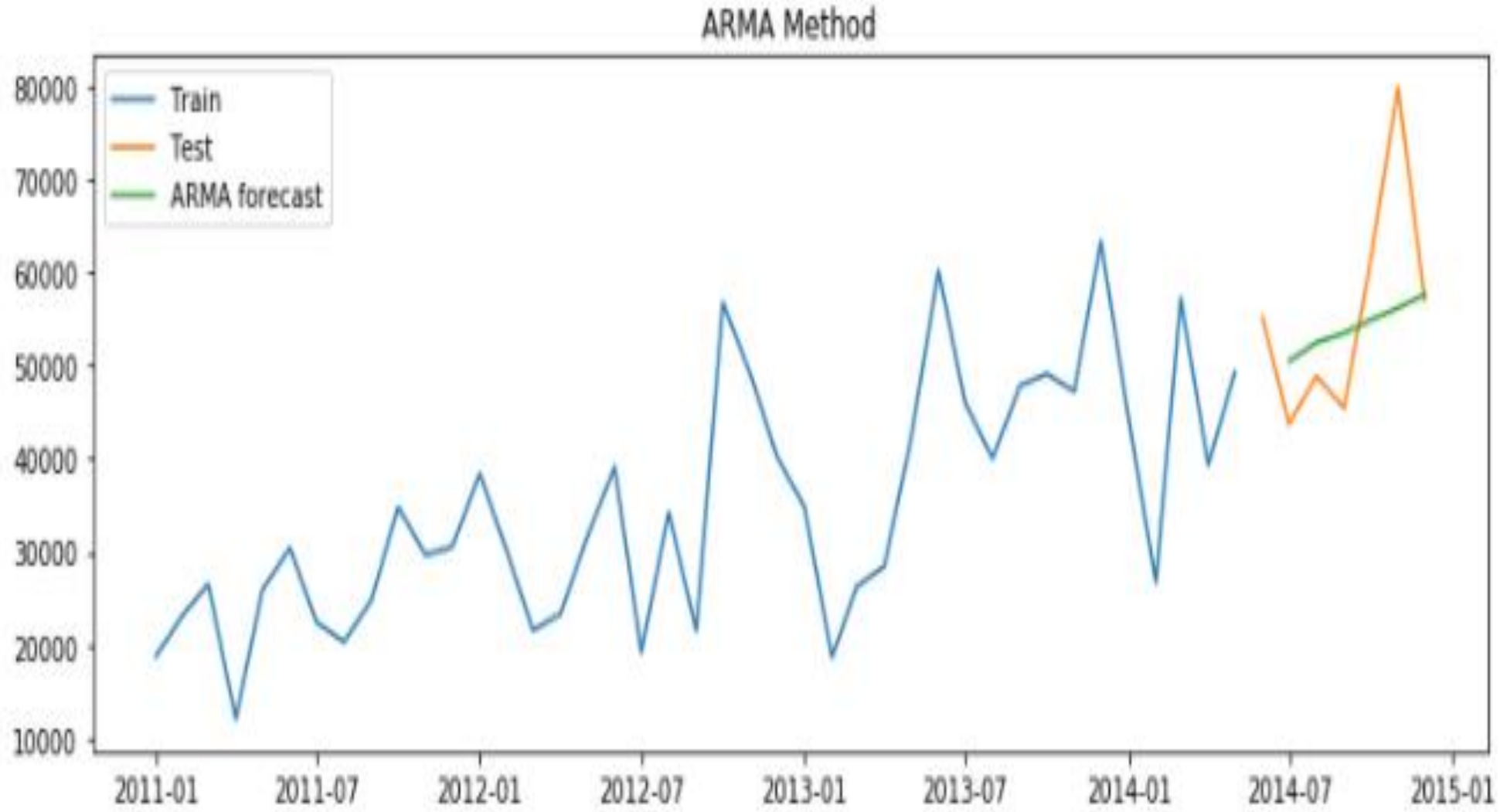
2013-07
2014-01
2014-07
2015-01


ARMA Method
Train
Test
ARMA forecast
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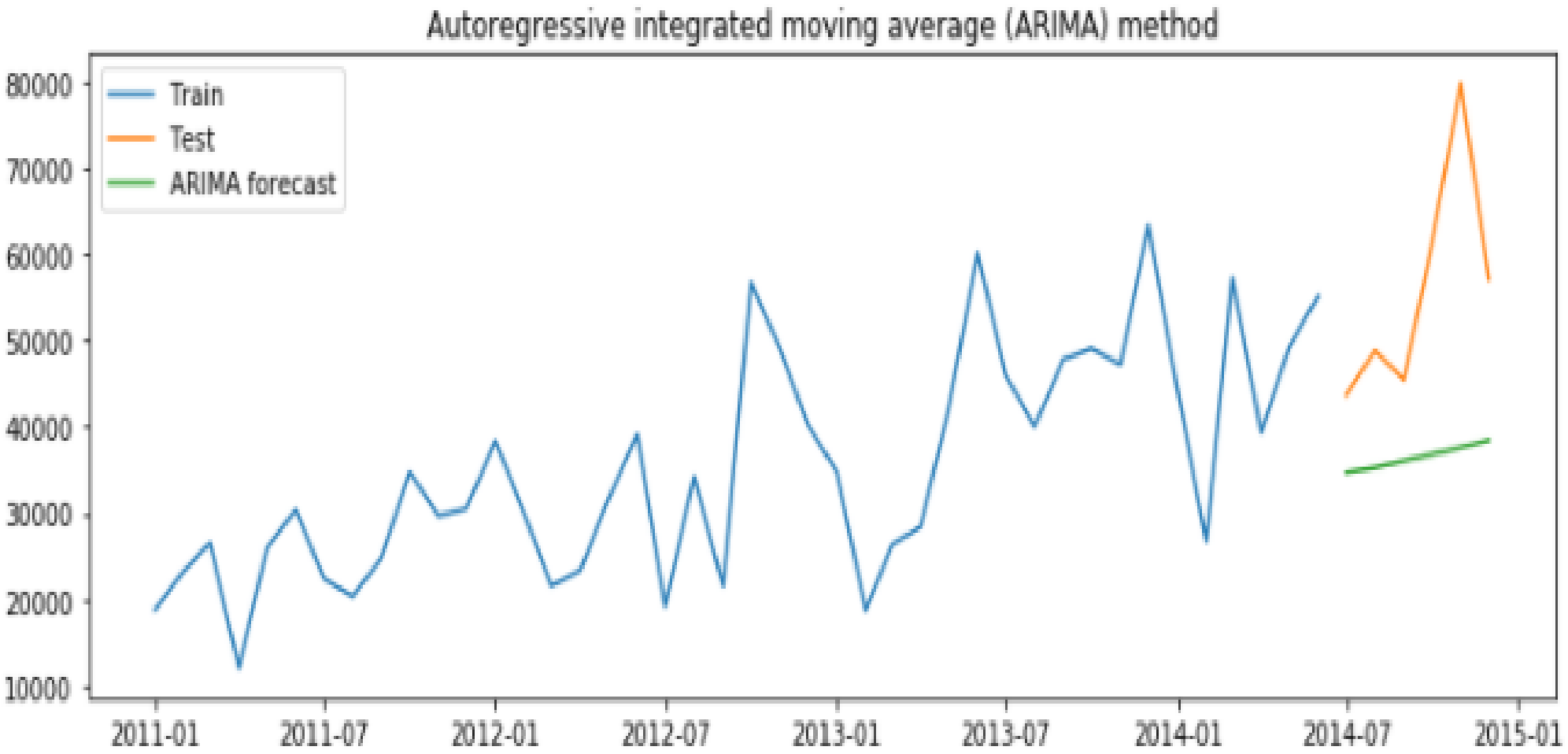
2013-07
2014-01
2014-07
2015-01


Autoregressive integrated moving average (ARIMA) method
Train
Test
ARIMA forecast
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2011-01
2011-07
2012-01
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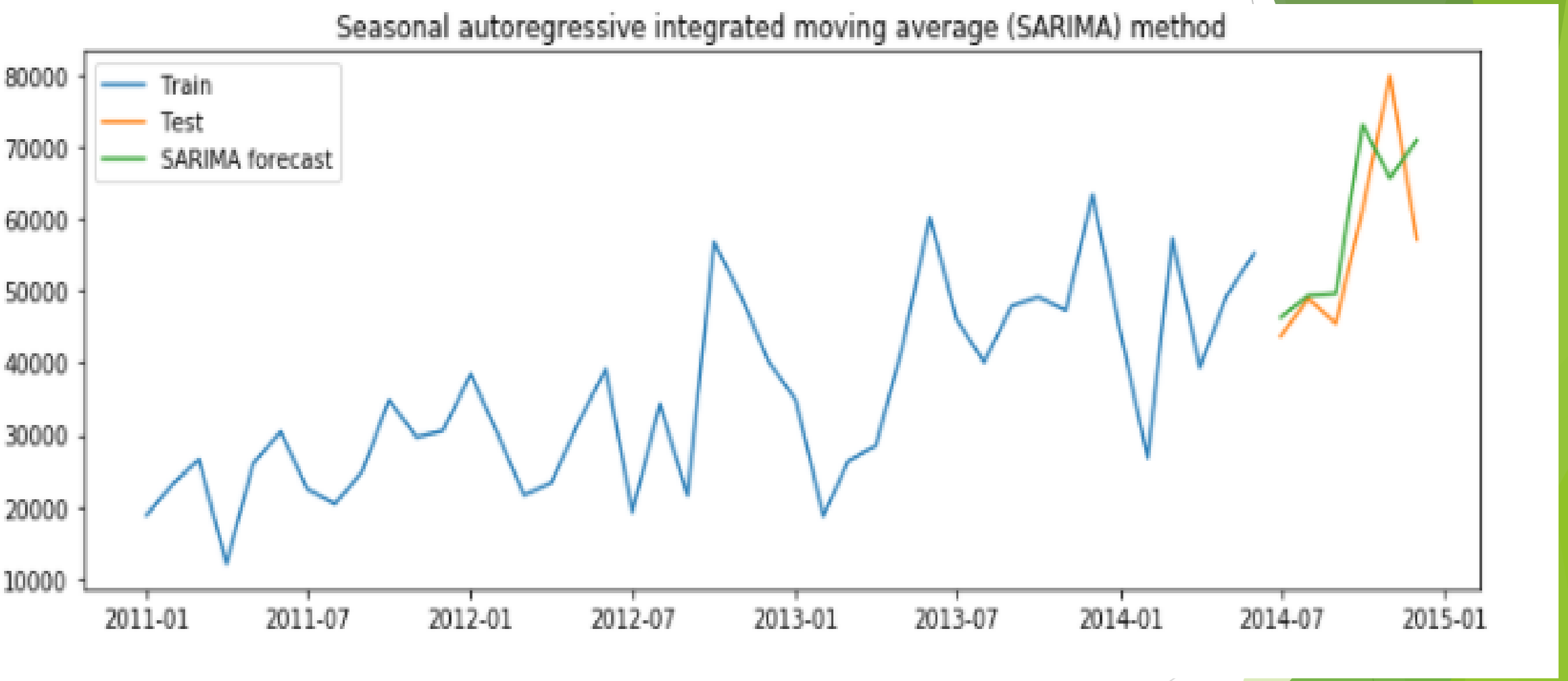
2014-07
2015-01


Seasonal autoregressive integrated moving average (SARIMA) method
Train
Test
SARIMA forecast
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2011-01
2011-07
2012-01
2012-07
2013-01
2013-07
2014-01
2014-07
2015-01

Comparison of RMSE and MAPE values of all models

	Method	RMSE	MAPE
0	Simple exponential smoothing forecast	15011.49	15.99
0	Holt's exponential smoothing method	18976.37	34.57
0	Holt Winters' additive method	8942.57	8.84
0	Holt Winters' multiplicative method	9976.32	10.12
0	Autoregressive (AR) method	10985.28	13.56
0	Moving Average (MA) method	10985.28	13.56
0	Autoregressive moving average (ARMA) method	10985.28	13.56
0	Autoregressive integrated moving average (ARIM...	22654.32	32.40
0	Seasonal autoregressive integrated moving aver...	9617.20	12.88

Conclusions on which technique works the best for the sales forecast and why? Then reason this using the forecast plot and the MAPE values both.

- The factors which were considered for selecting best forecast method include trend and seasonality. From the graphs the seasonality and trend of the data was significantly evident.
- Out of plotting sales forecast for these different technique one with the least MAPE error was selected as the best forecasting technique.
- Those are : **Holt Winter's Additive method** from all the smoothing techniques and their MAPE values.
- **SARIMA** Technique all the ARIMA techniques and their MAPE values.