

# **Retail Giant Sales Forecasting Assignment**

# Problem Statement & Analysis Approach

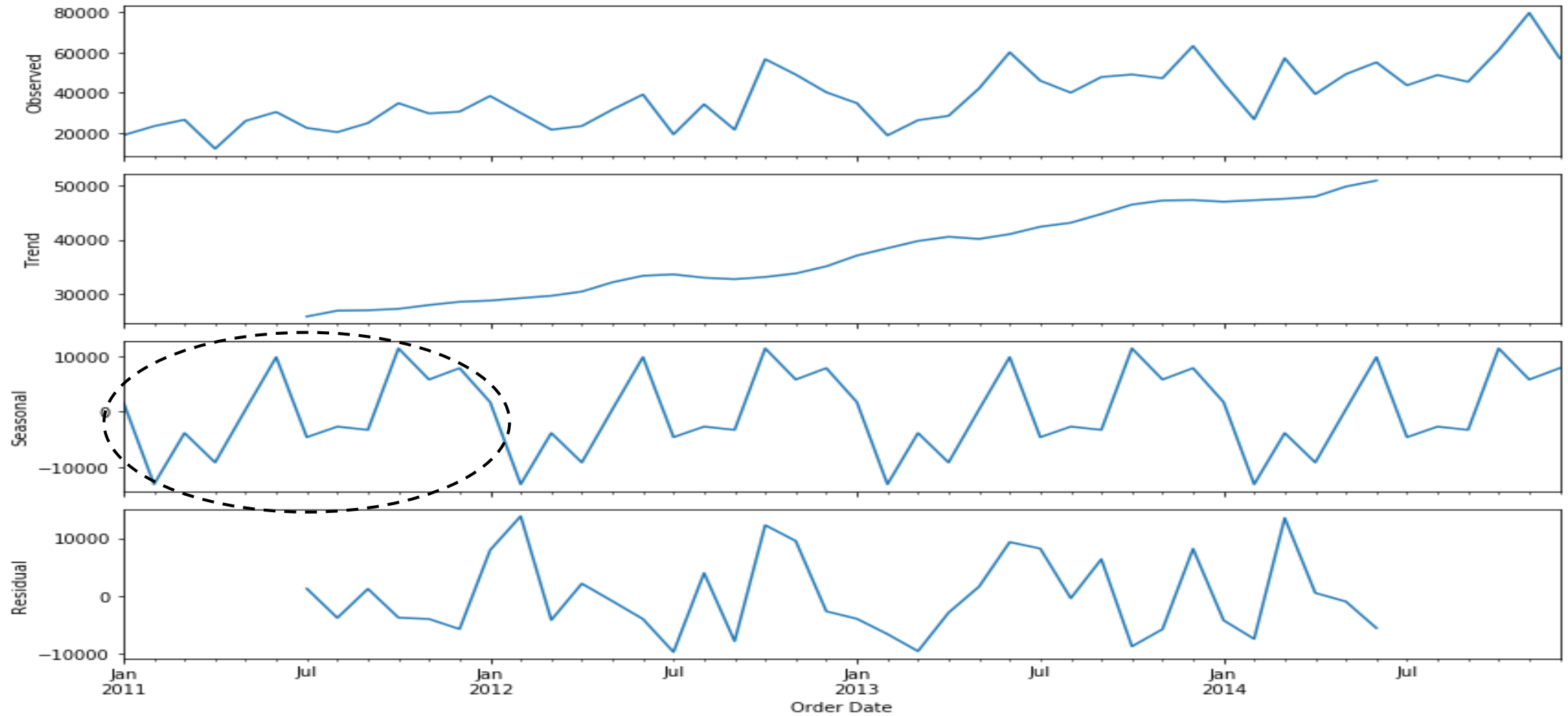
## Business Problem:

- As a sales manager for this store, you have to forecast the sales of the products for the next 6 months, so that you have a proper estimate and can plan your inventory and business processes accordingly.

## Analytical Approach:

- The Analysis is basically performed as follows
  - We need to use Naïve, SA, SMA, SES, Holt methods, and Auto Regressive Methods with MAPE Score so that we can find the best model to grow the Sale

# Seasonal Patterns and Trends



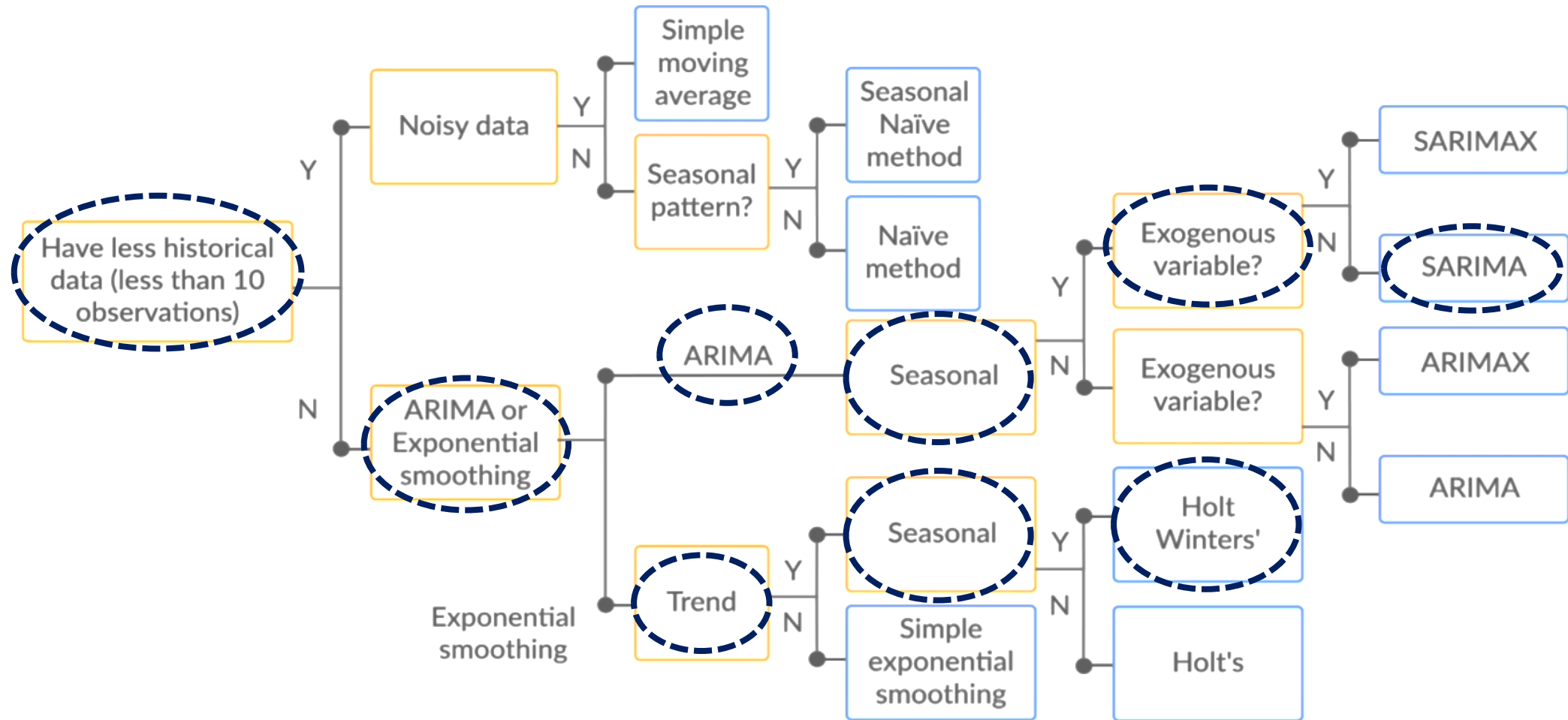
- Sales data have the Seasonal Patterns in an every 06 months
- Sales trend is growing from beginning

# 21 Market Segments & COV's

Market Segment	
APAC_Consumer	0.522725
APAC_Corporate	0.530051
APAC_Home Office	1.008219
Africa_Consumer	1.310351
Africa_Corporate	1.891744
Africa_Home Office	2.012937
Canada_Consumer	1.250315
Canada_Corporate	1.786025
Canada_Home Office	2.369695
EMEA_Consumer	2.652495
EMEA_Corporate	6.355024
EMEA_Home Office	7.732073
EU_Consumer	0.595215
EU_Corporate	0.722076
EU_Home Office	0.938072
LATAM_Consumer	0.683770
LATAM_Corporate	0.882177
LATAM_Home Office	1.169693
US_Consumer	1.010530
US_Corporate	1.071829
US_Home Office	1.124030

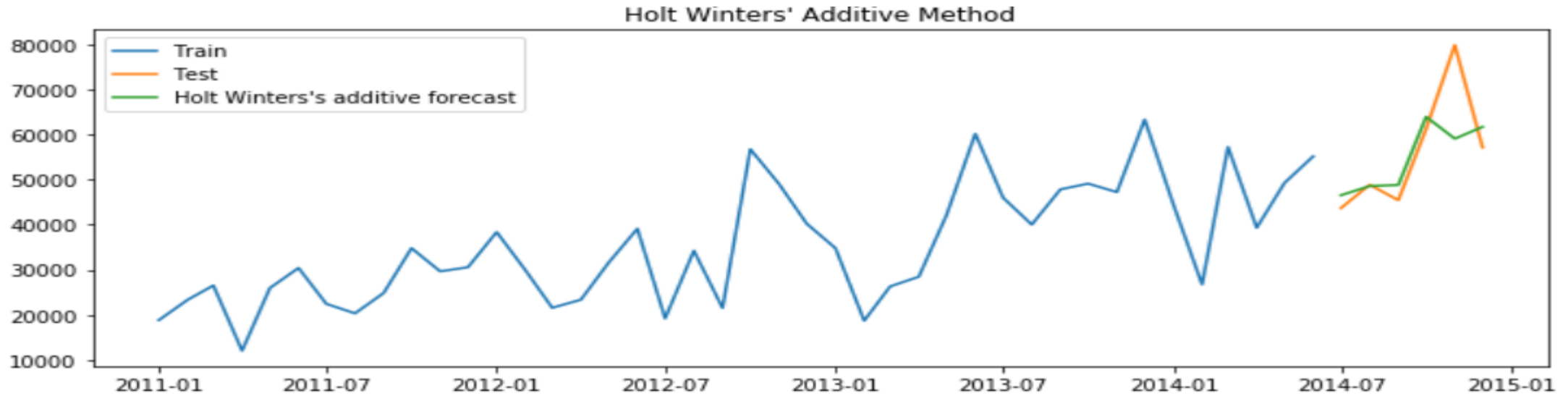
- APAC\_Consumer is the lowest COV Value – 0.522725, followed by APAC\_Corporate – 0.530051
- Highest COV value is of EMEA\_Home Office – 7.732073
- APAC\_Consumer market segment is more profitable because the Sale is continuously increasing and the Coefficient of Variance is also low

# Flow Chart - Best fit Models



- Holt Winter's Method is the best fit model because we have Greater than 10 observations → ARIMA or Exponential smoothing → Trend → Seasonal Patterns in the data set
- Another model we can choose "SARIMA", because have Greater than 10 observations → ARIMA or Exponential smoothing → ARIMA → Seasonal Patterns → Exogenous variables

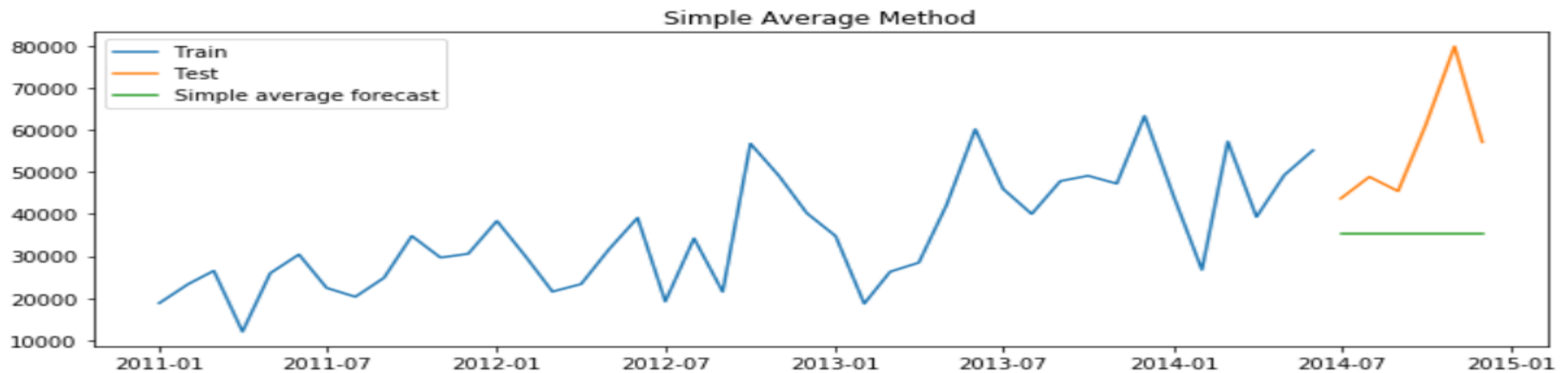
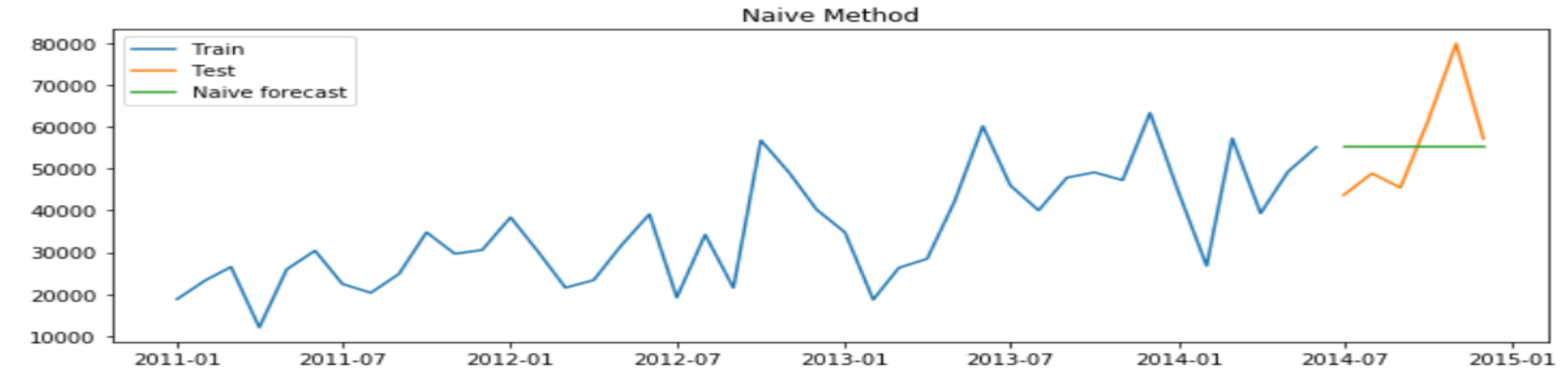
# Smoothing Techniques and MAPE Values



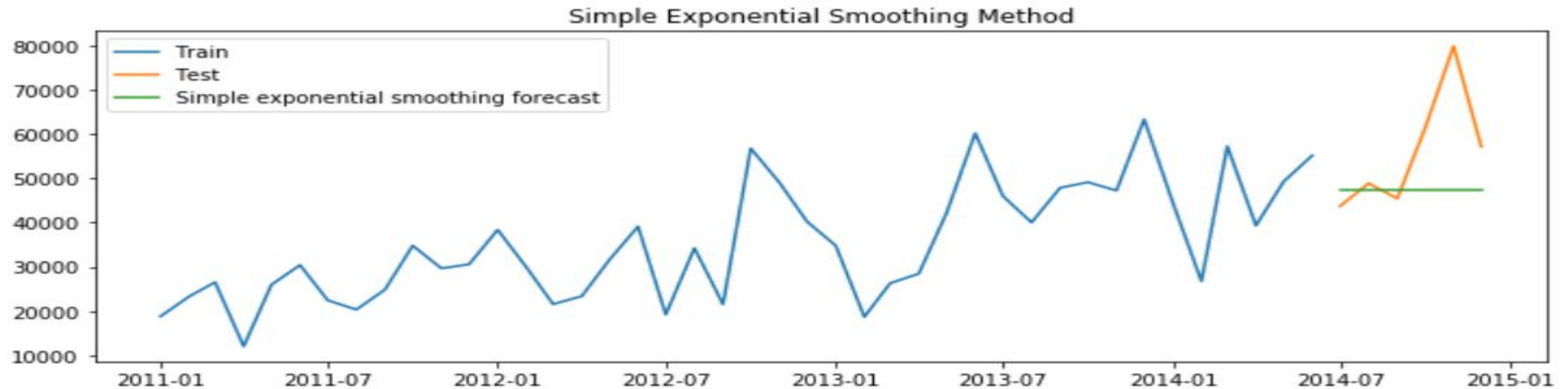
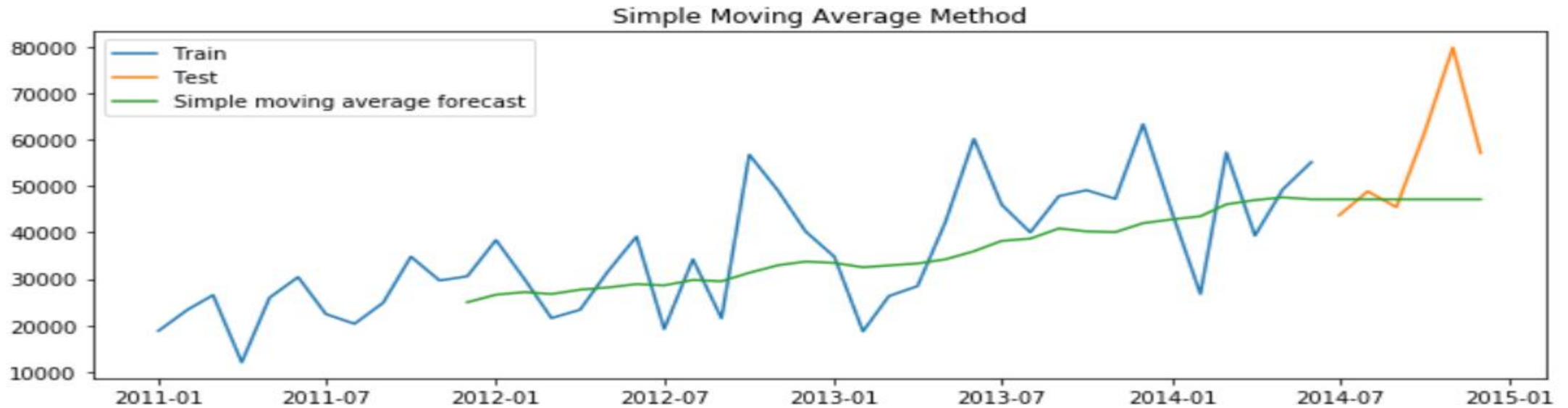
	Method	MAPE
0	Naive method	17.47
0	Simple average method	34.34
0	Simple moving average forecast	16.10
0	Simple exponential smoothing forecast	15.99
0	Holt's exponential smoothing method	34.57
0	Holt Winters' additive method	8.84
0	Holt Winters' multiplicative method	10.12

- “Holt Winters’ additive method” model is best fit and the lowest MAPE Value

# Smoothing Techniques and MAPE Values

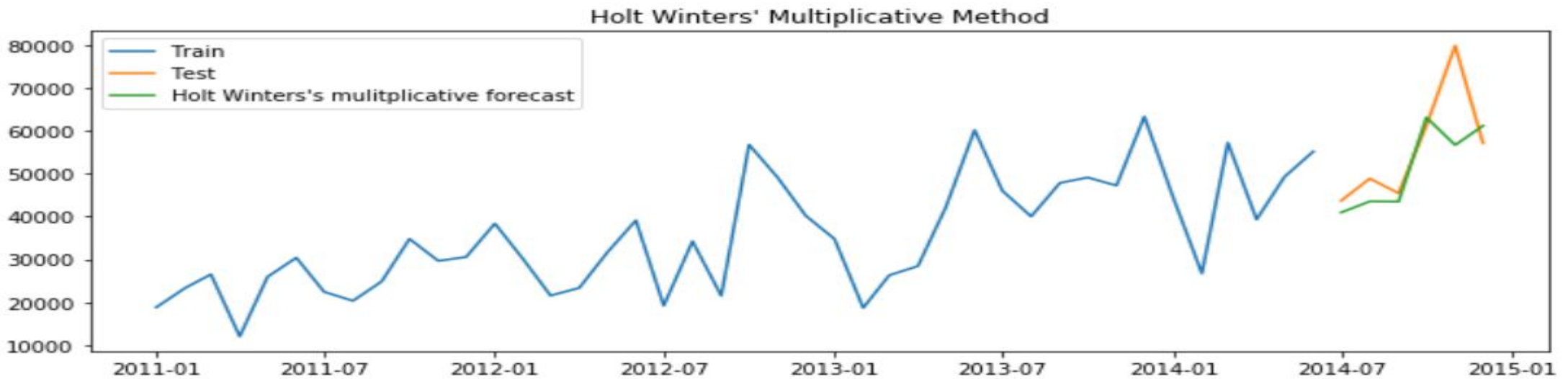
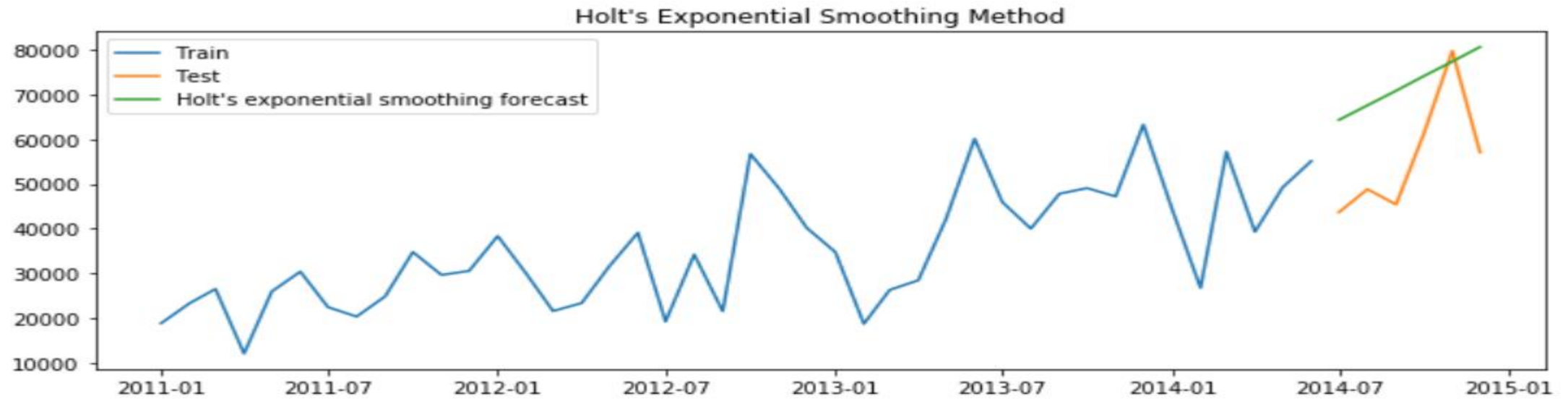


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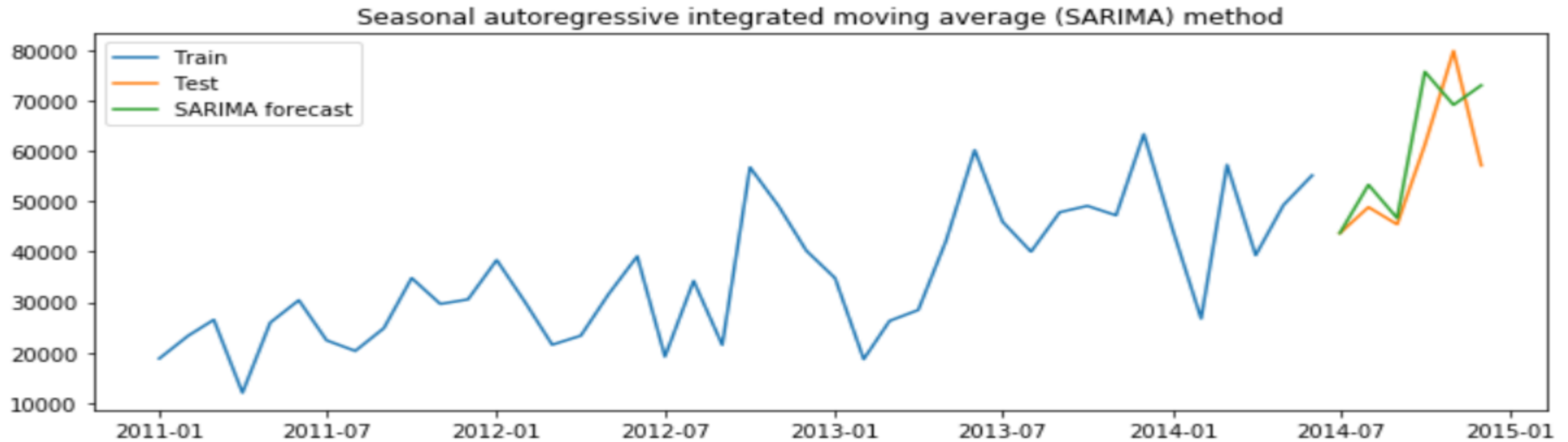




# Smoothing Techniques and MAPE Values



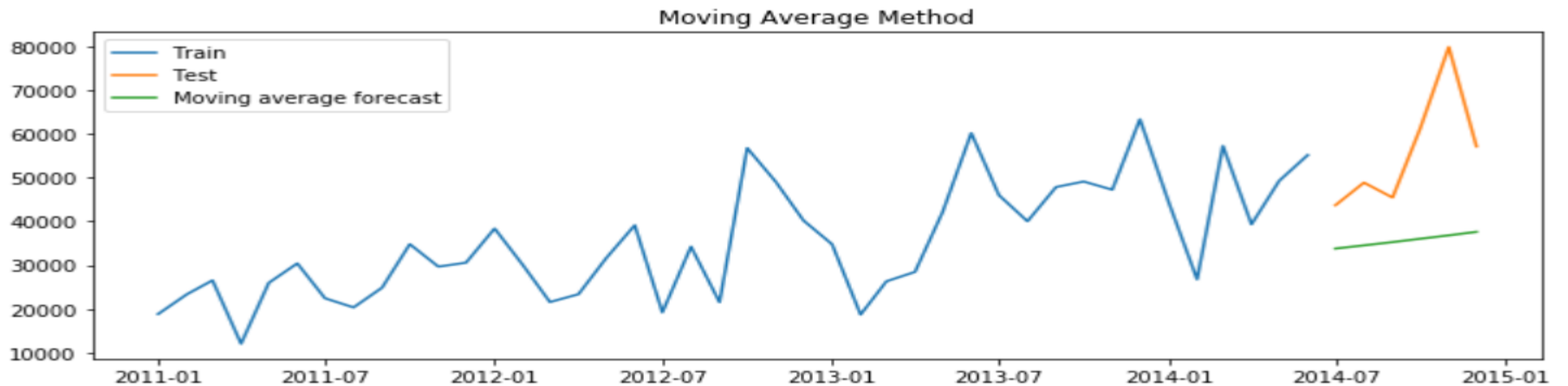
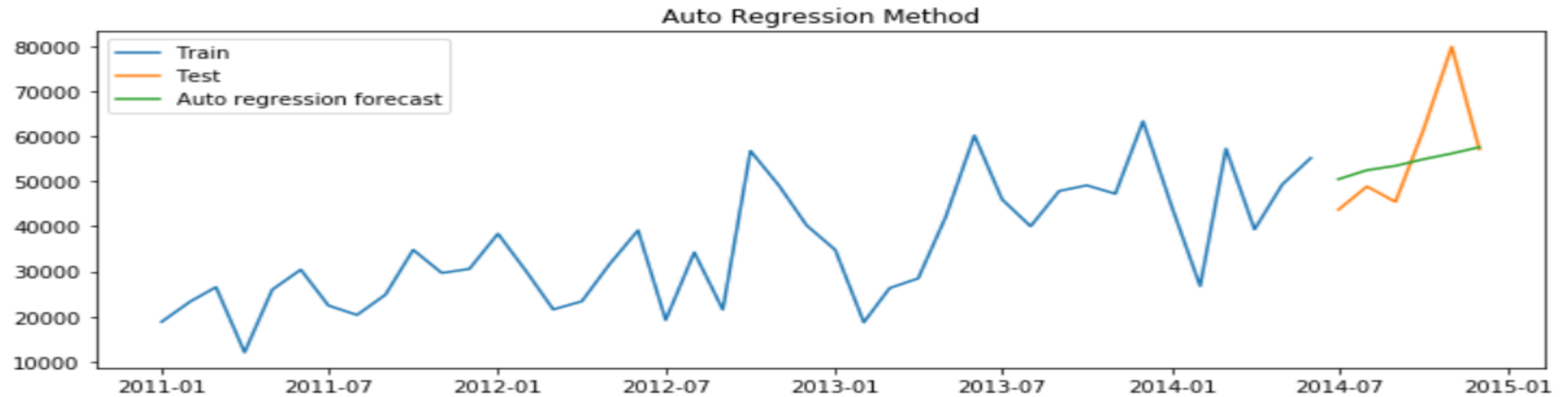
# ARIMA Techniques and MAPE Values



	Method	MAPE
0	Autoregressive (AR) method	13.56
0	Moving Average (MA) method	33.93
0	Autoregressive moving average (ARMA) method	32.40
0	Autoregressive integrated moving average (ARIM...	32.40
0	Seasonal autoregressive integrated moving aver...	12.79

- “SARIMA” model is best fit and the lowest MAPE Value

# ARIMA Techniques and MAPE Values



# ARIMA Techniques and MAPE Values

