RETAIL-GIANT SALES FORECASTING CASE STUDY

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BUSINESS OBJECTIVE

- Global Mart is an online supergiant store that has worldwide operations. This store takes orders and delivers across the globe and deals with all the major product categories — consumer, corporate and home office.
- 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.

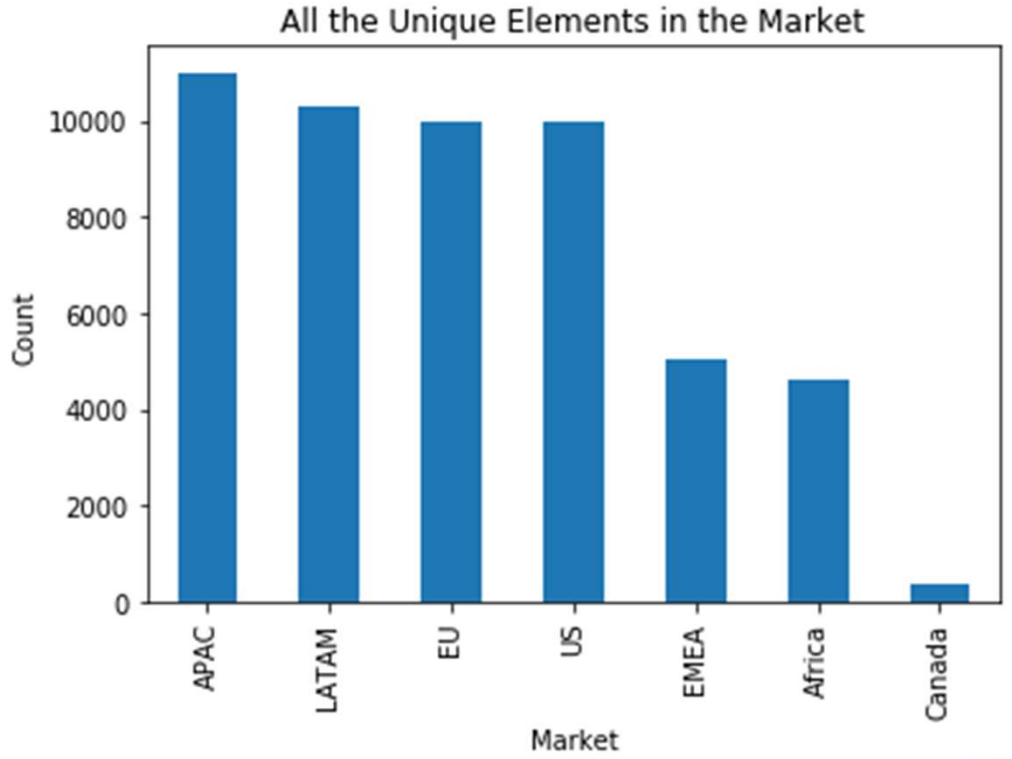
DATA UNDERSTANDING & PREPARATION

- 51290 transactions from 2011 – 2014
- Focusing mainly on month and year wise aggregated values of Sales and Profit
- With 3 segments and in 7 market regions

- Prepared the aggregated data with 21 market-segments
- Found the topmost profitable segments as APAC_Consumer by calculating Coefficient of Variation.

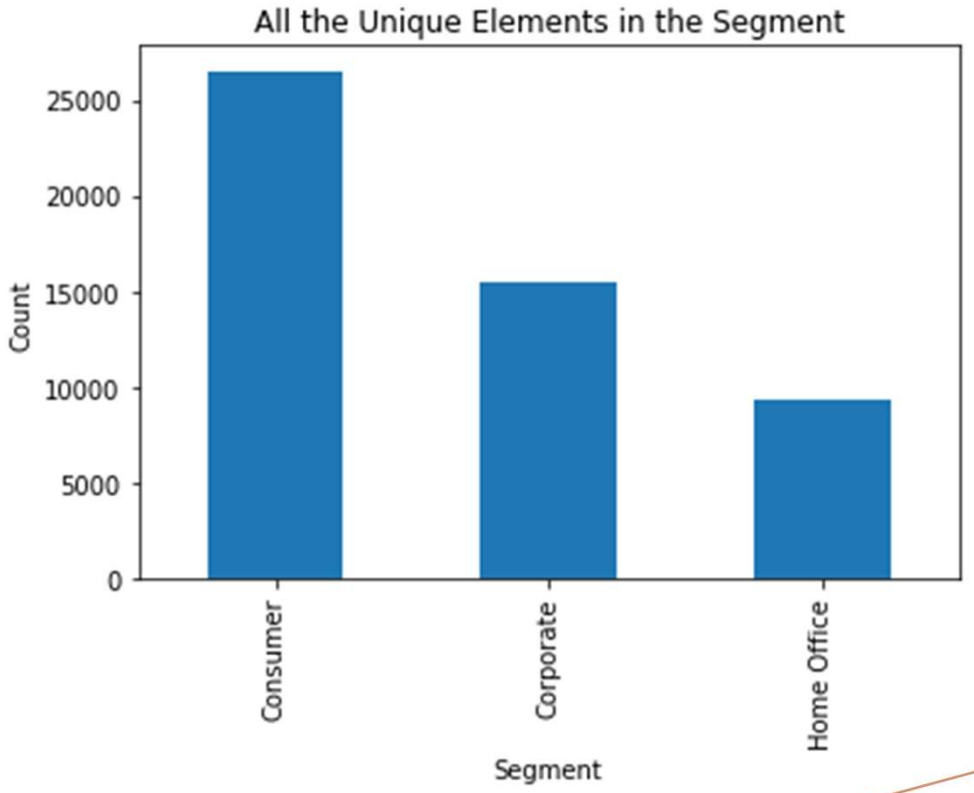
TYPES OF MARKET

- There are 7 types of Market
  - a) APAC
  - b) LATAM
  - c) EU
  - d) US
  - e) EMEA
  - f) Africa
  - g) Canada

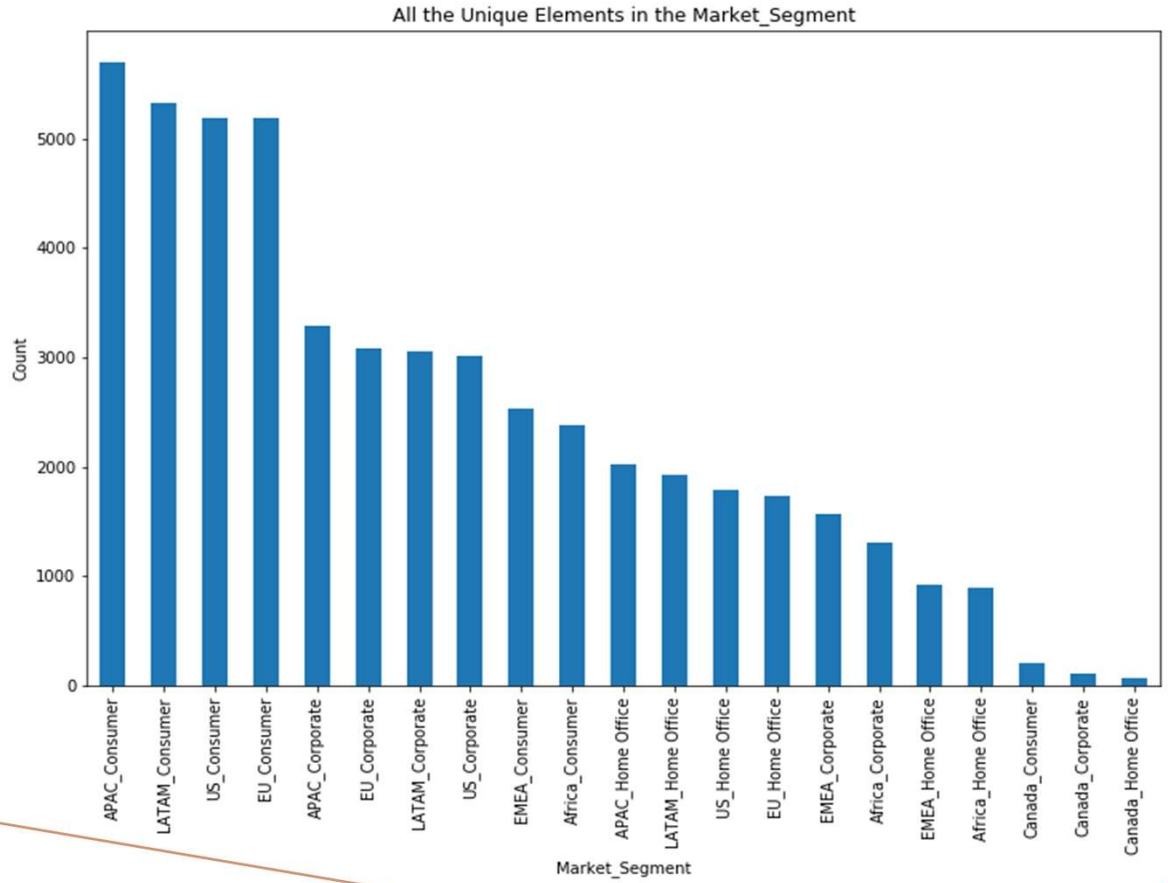


TYPES OF SEGMENT

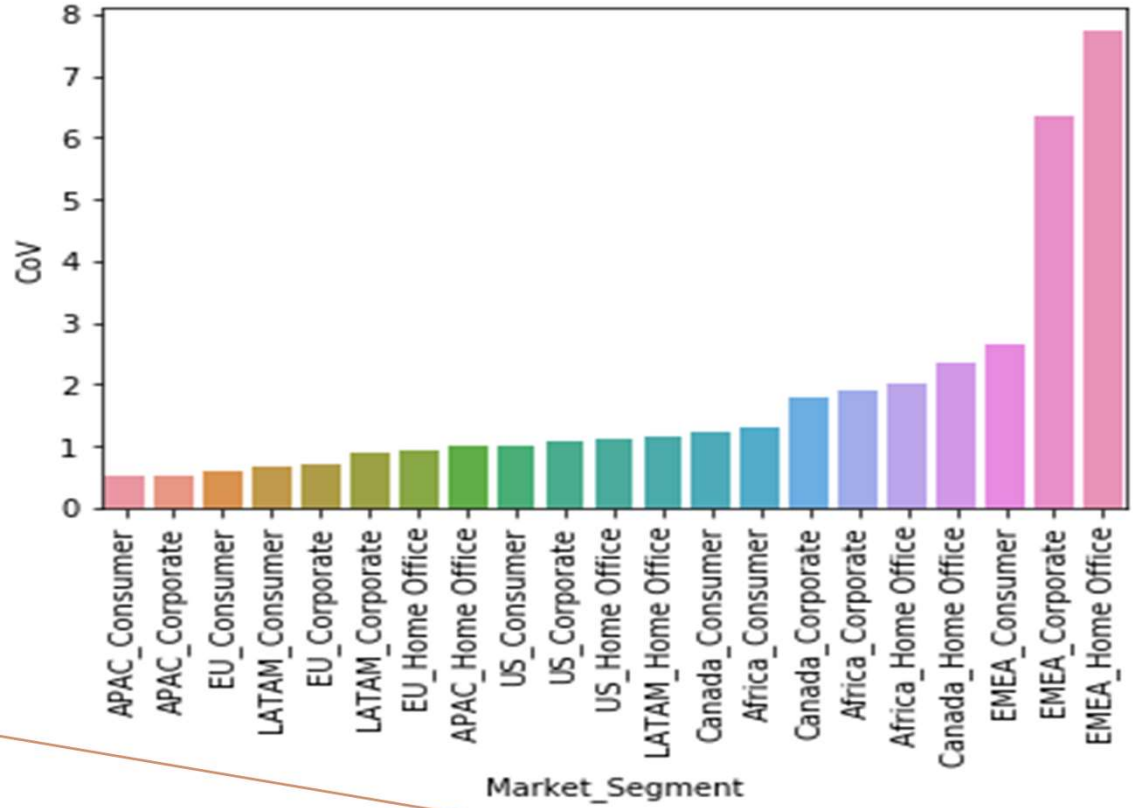
- There are 3 types of Segment
  a) Consumer
  b) Corporate
  c) Home Office



TYPES OF MARKET_SEGMENT



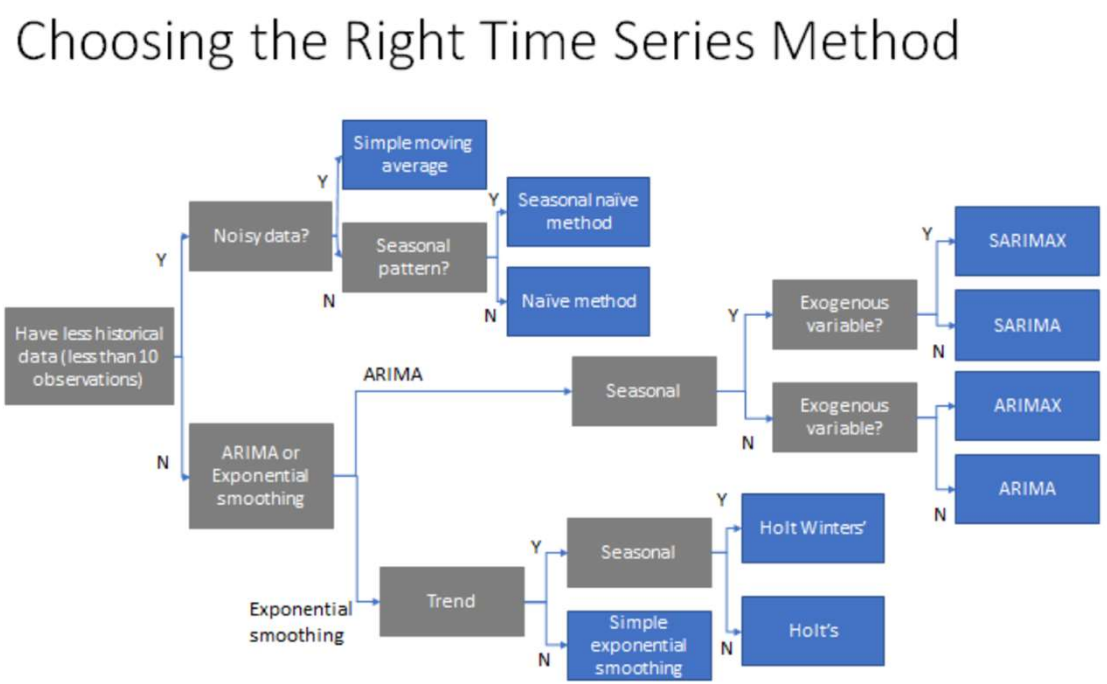
COEFFICIENT OF VARIATION CALCULATED ON THE PROFIT FOR THE 21 MARKET SEGMENTS



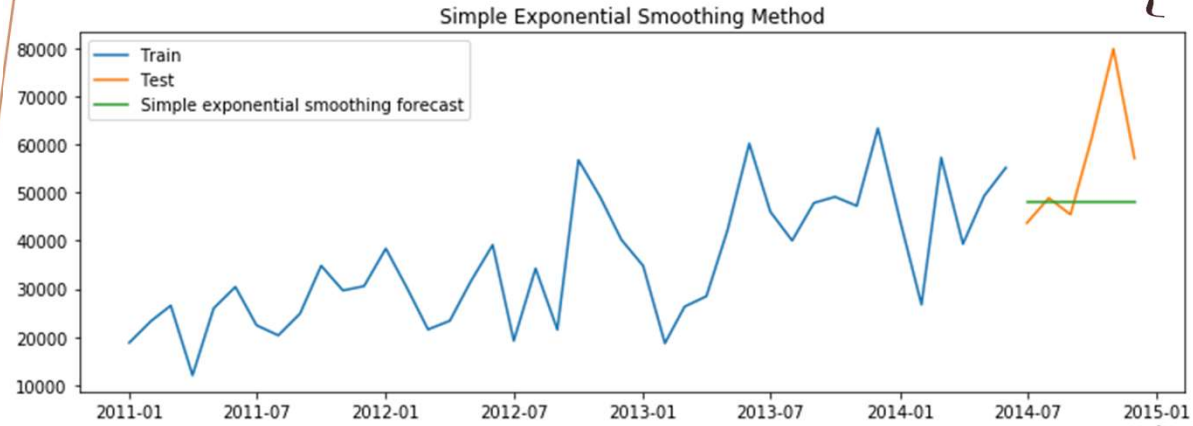
HOW TO SELECT THE MOST PROFITABLE MARKET SEGMENT

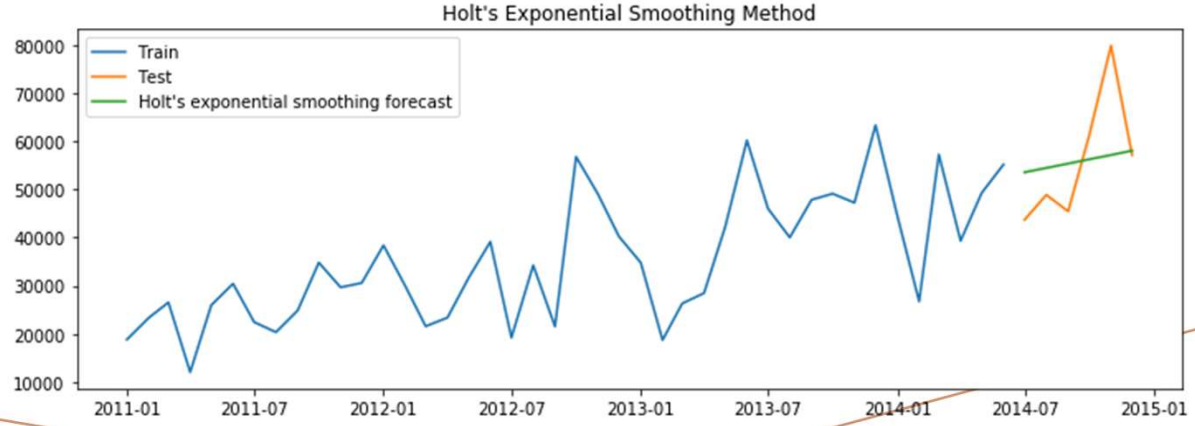
- We compare the variance between the segments using the coefficient of variation which will normalize the standard deviation with the mean and give a comparative figure on the basis of which we can identify the most profitable market segement
- We want to forecast sales where market segment is reliable or there is less variations in the profits
- Choosing the Market_Segment with the least CoV value and we can see that the lowest CoV value is 0.52272
- Hence we can infer that the most profitable market segment is APAC_Consumer

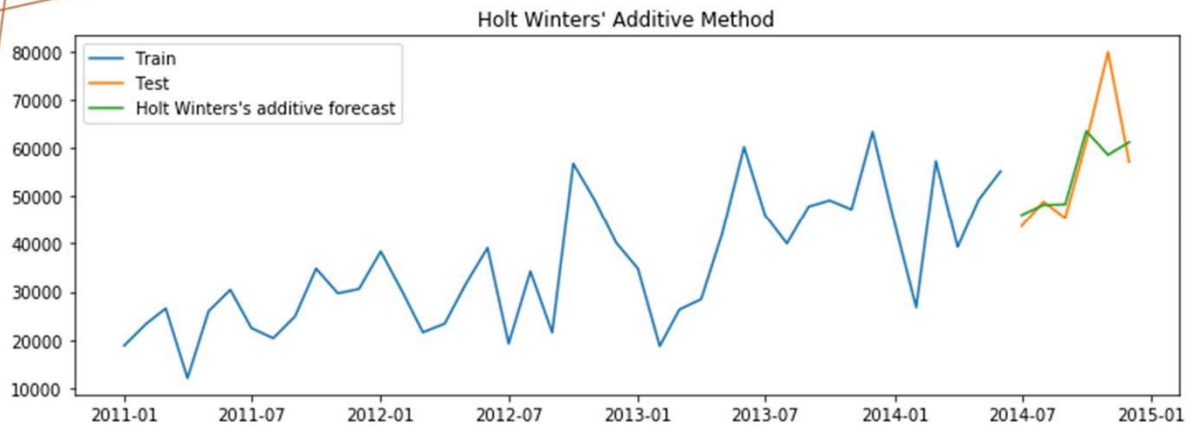
OPTIMUM TECHNIQUE FROM THE FLOW CHART THAT WOULD WORK BEST FOR THE SALES FORECAST



SALES FORECAST PLOTS FOR SMOOTHING TECHNIQUES






Holt Winters' Additive Method
Train
Test
Holt Winters's additive forecast
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2011-01
2011-07
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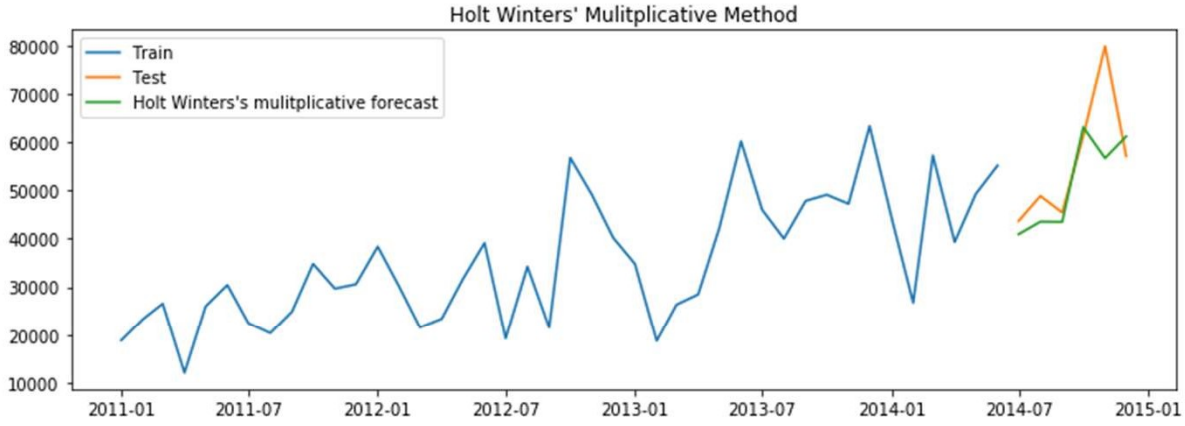
2015-01


Holt Winters' Mulitplicative Method
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Holt Winters's mulitplicative forecast
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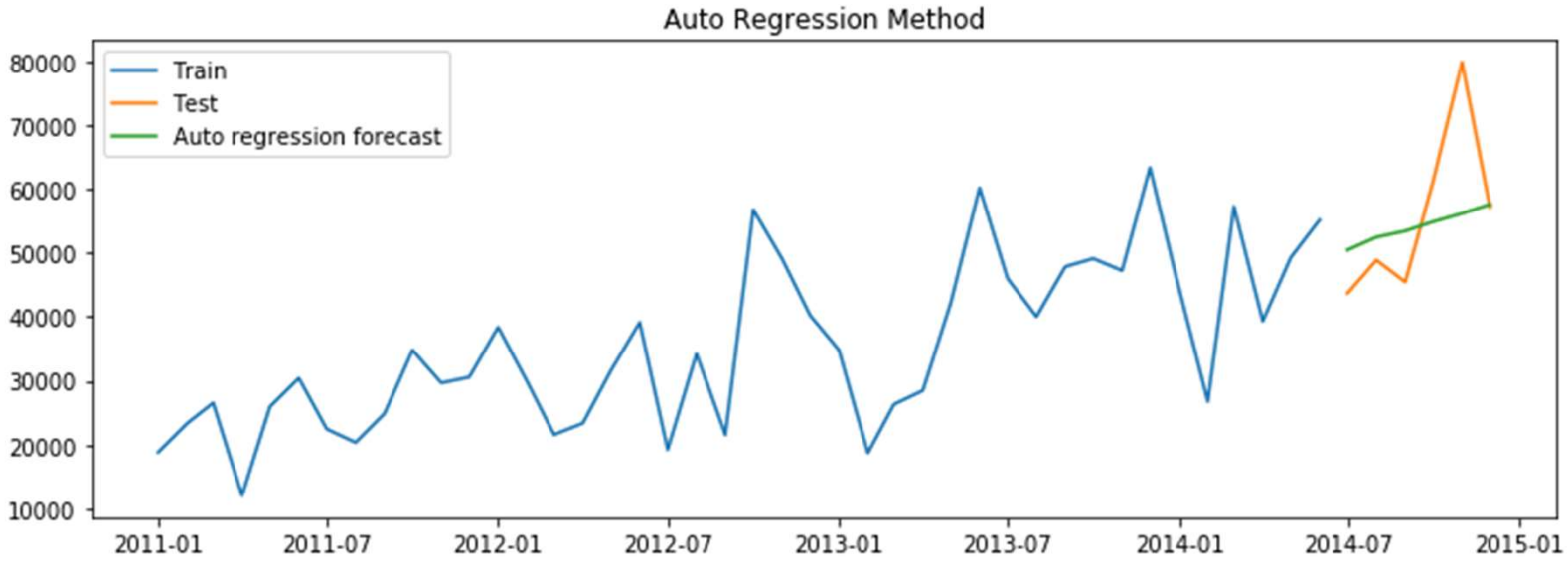
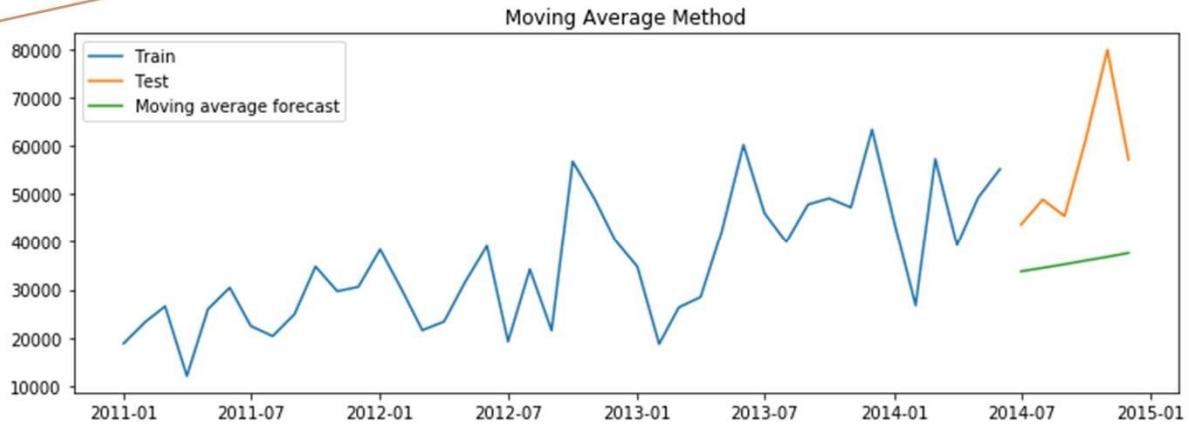
2014-01
2014-07
2015-01

RMSE AND MAPE VALUES FOR SMOOTHING TECHNIQUES

	Method	RMSE	MAPE
0	Simple exponential smoothing forecast	14764.97	15.83
0	Holt's exponential smoothing method	11315.31	15.68
0	Holt Winters' additive method	9026.50	8.44
0	Holt Winters' multiplicative method	9976.49	10.12

SALES FORECAST PLOTS FOR ARIMA TECHNIQUES




Moving Average Method
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Moving average forecast
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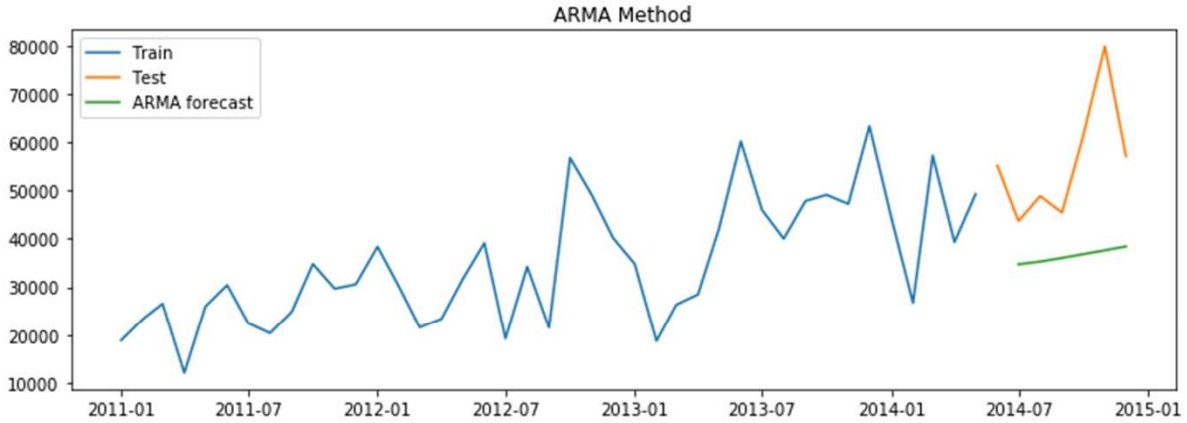
ARMA Method
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ARMA forecast
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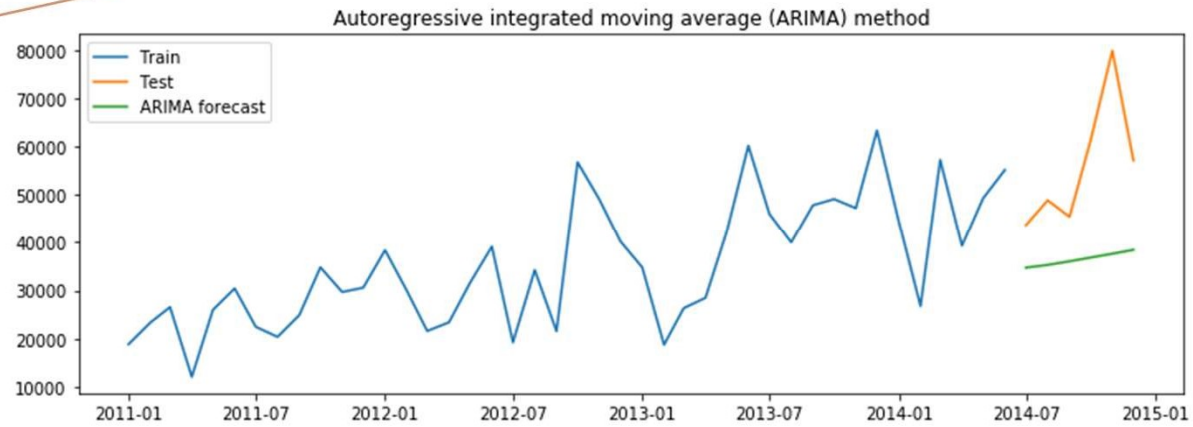
Autoregressive integrated moving average (ARIMA) method
Train
Test
ARIMA forecast
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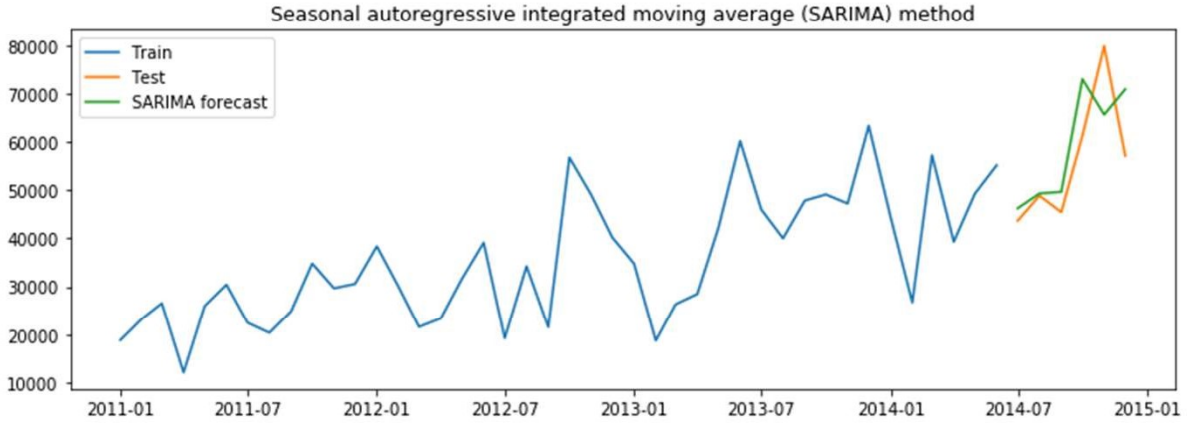
Seasonal autoregressive integrated moving average (SARIMA) method
Train
Test
SARIMA forecast
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2014-07
2015-01

RMSE AND MAPE VALUES FOR ARIMA TECHNIQUES

	Method	RMSE	MAPE
0	Autoregressive (AR) method	10985.28	13.56
0	Moving Average (MA) method	23360.02	33.93
0	Autoregressive moving average (ARMA) method	22654.33	32.40
0	Autoregressive integrated moving average (ARIM...	22654.33	32.40
0	Seasonal autoregressive integrated moving aver...	9616.86	12.88

CONCLUSION

- We can conclude that Holt Winters additive method is the best forecasting method in the smoothing technique because it has the lowest value of MAPE.
- We can conclude that SARIMA method is the best forecasting method in the ARIMA technique because it has the lowest value of MAPE.