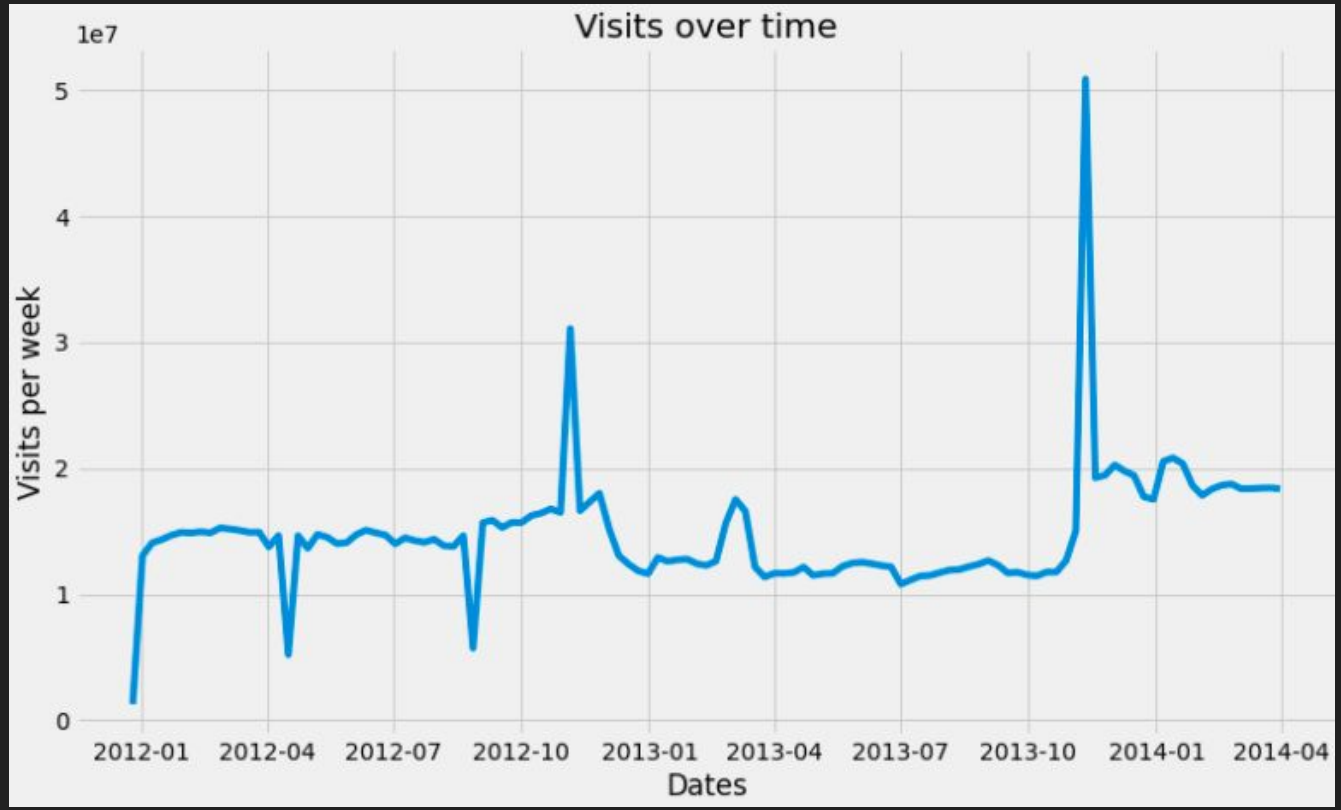
Time Series Forecasting - Weekly Visits

Created a forecast for what the visits would look like for the next year based on the historic data points of weekly visits.

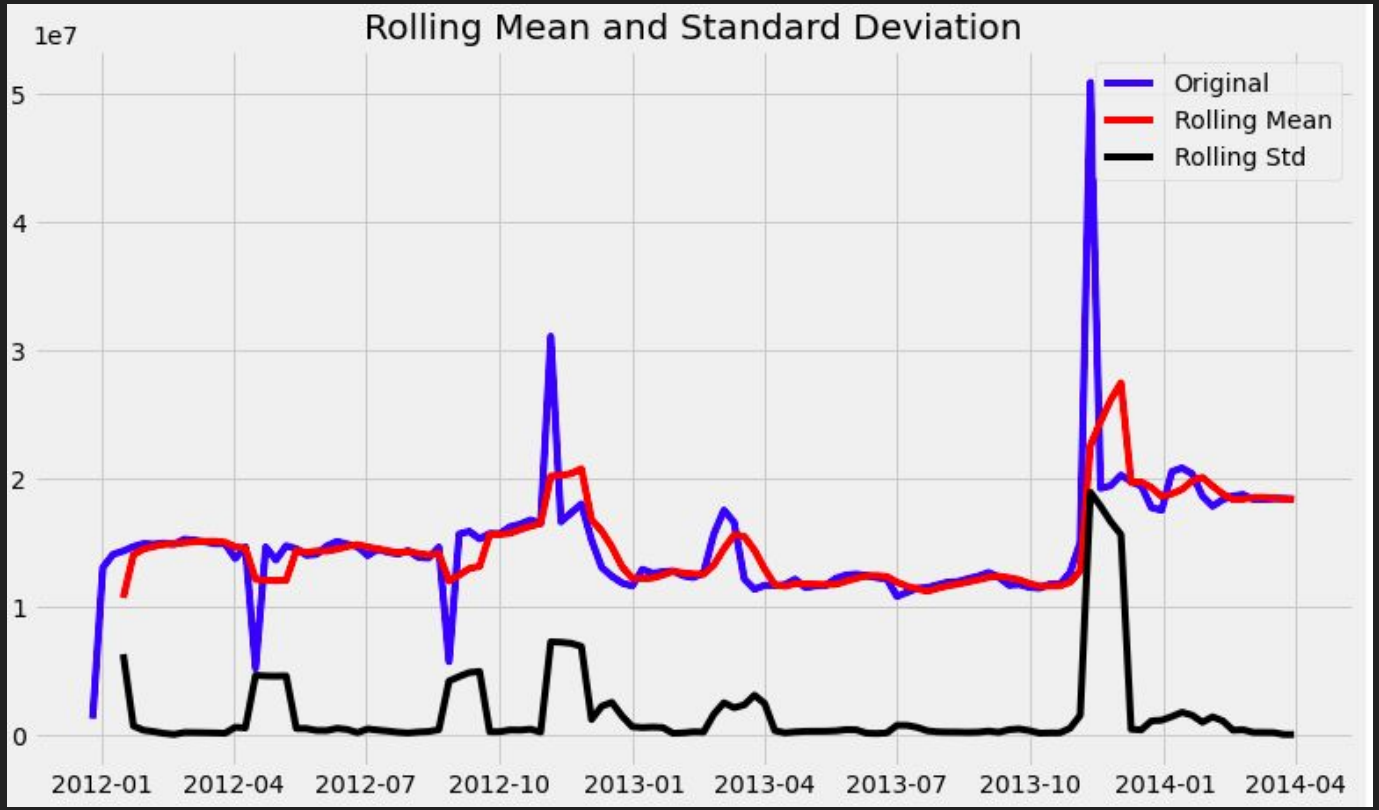
Adamya Nayyar

Original Data

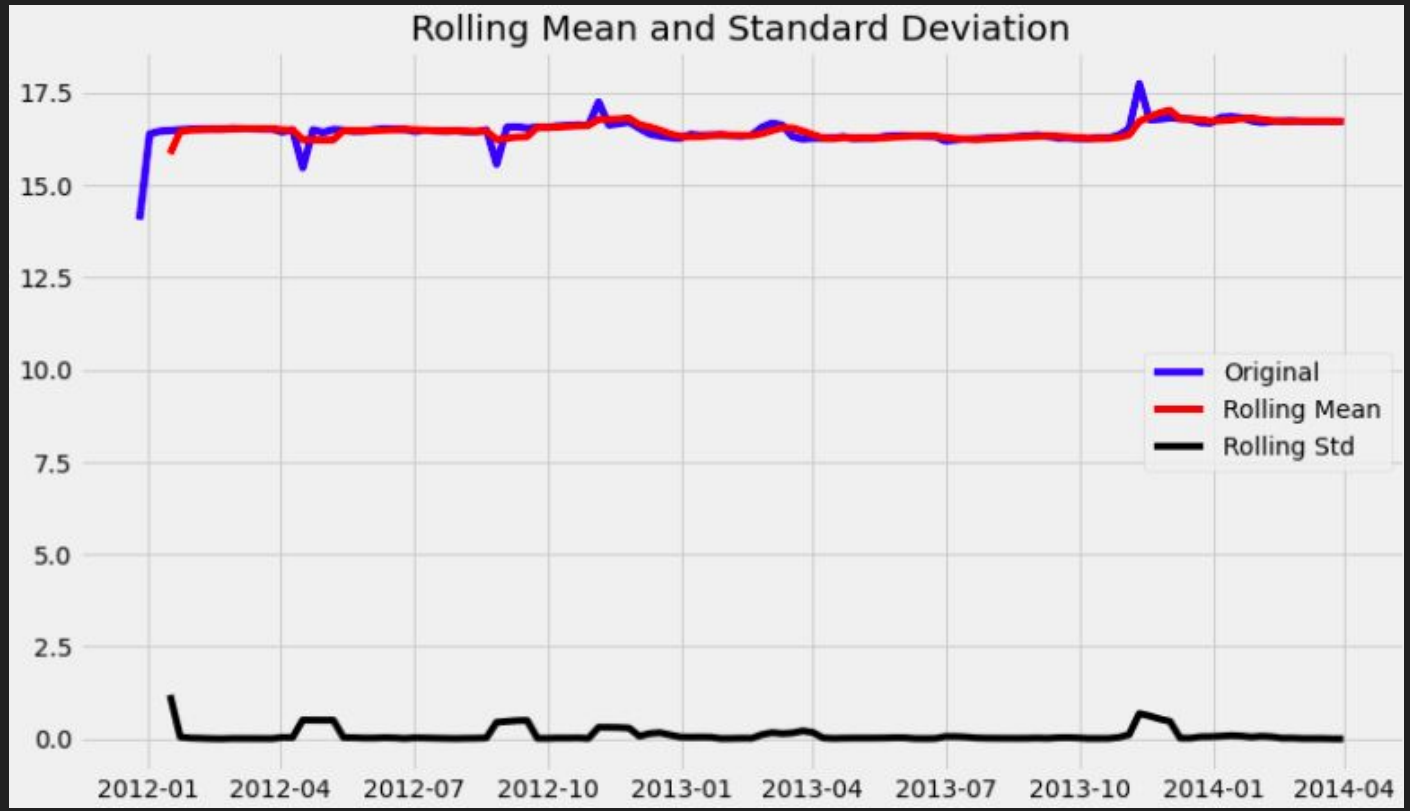


Seasonal Decompose

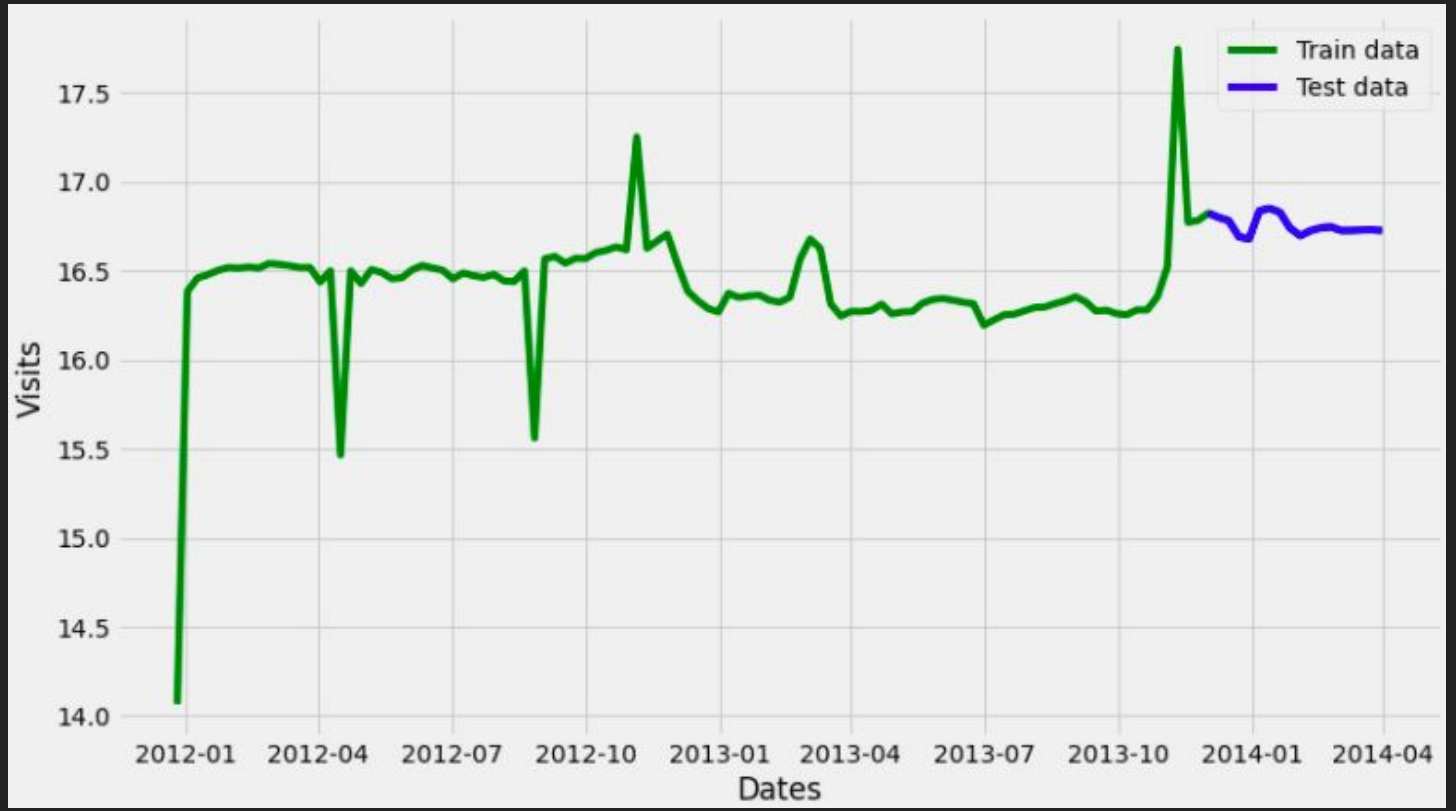
Stationarity Test



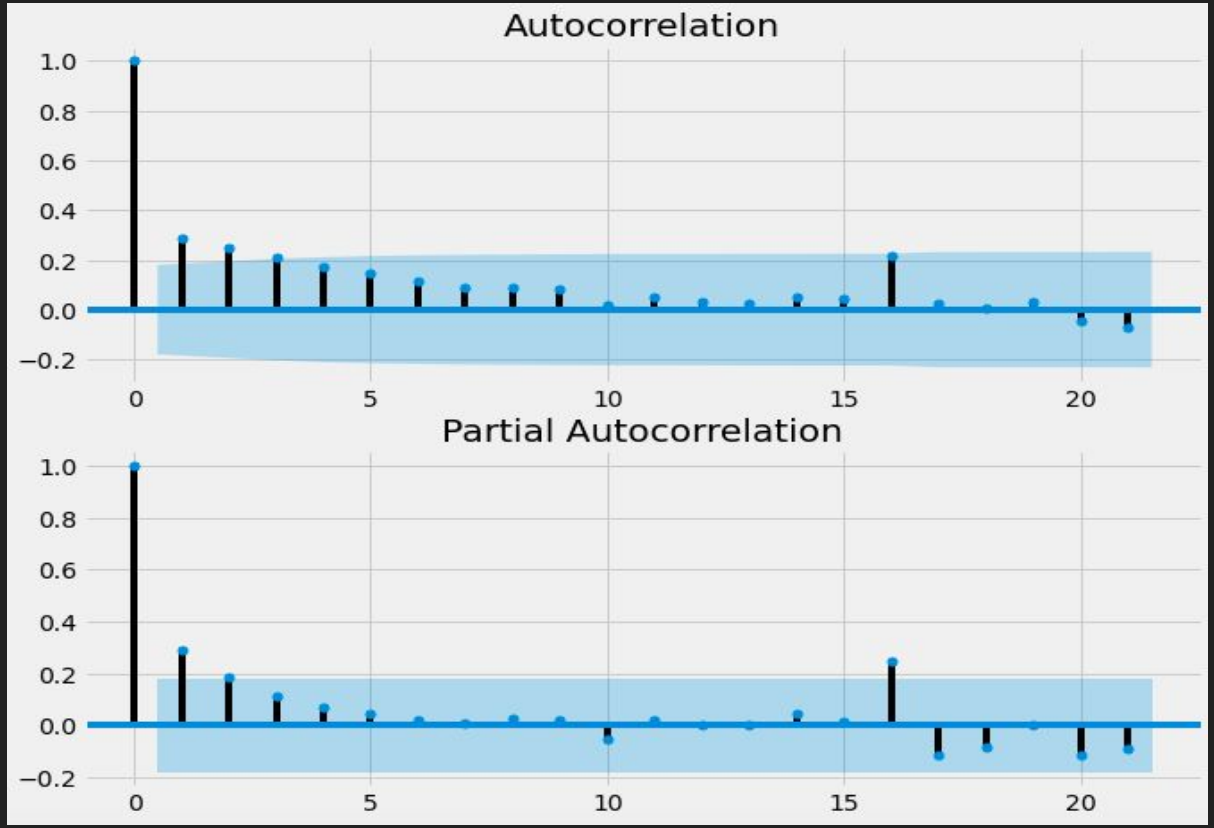
Stationary after Log Transform



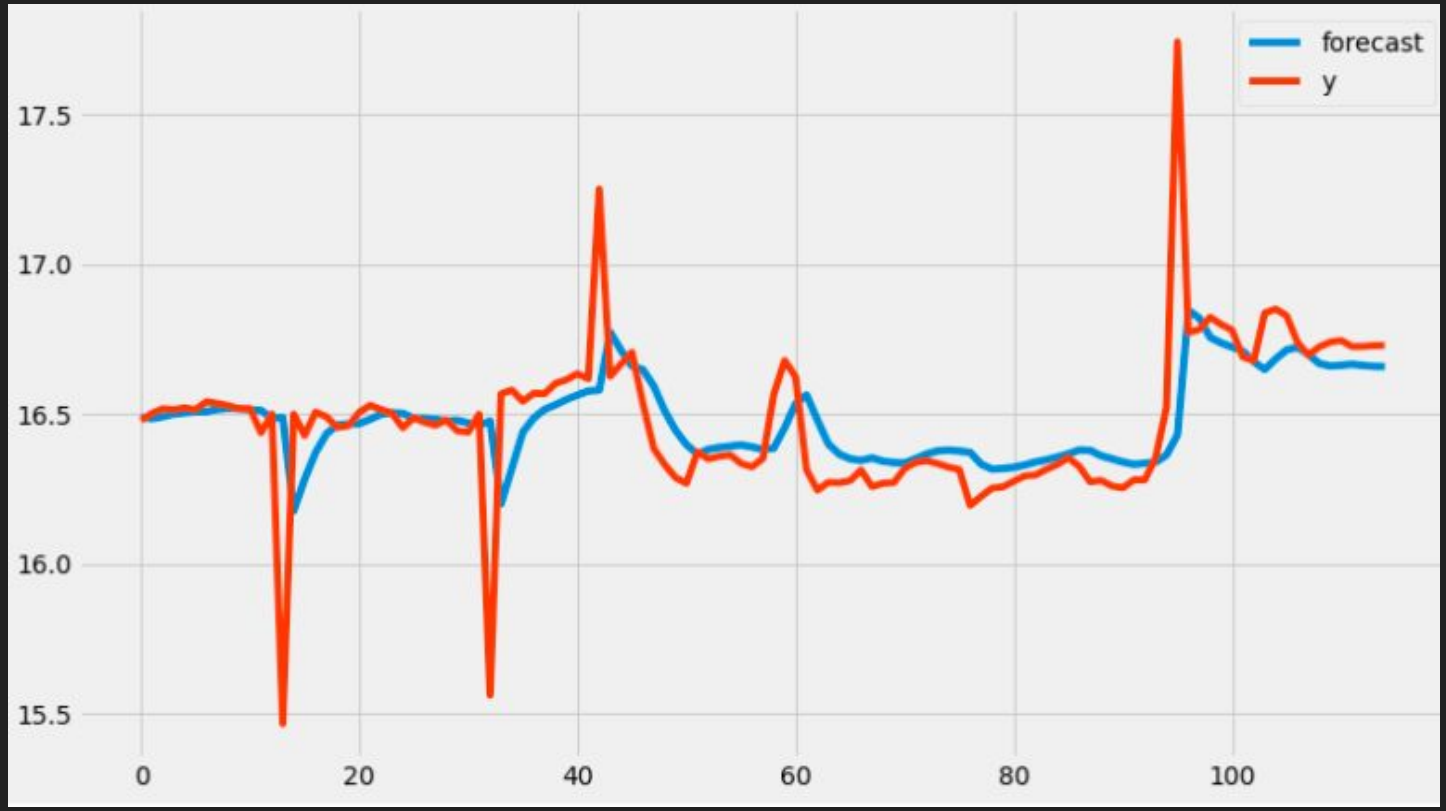
Train Test Split for Modeling



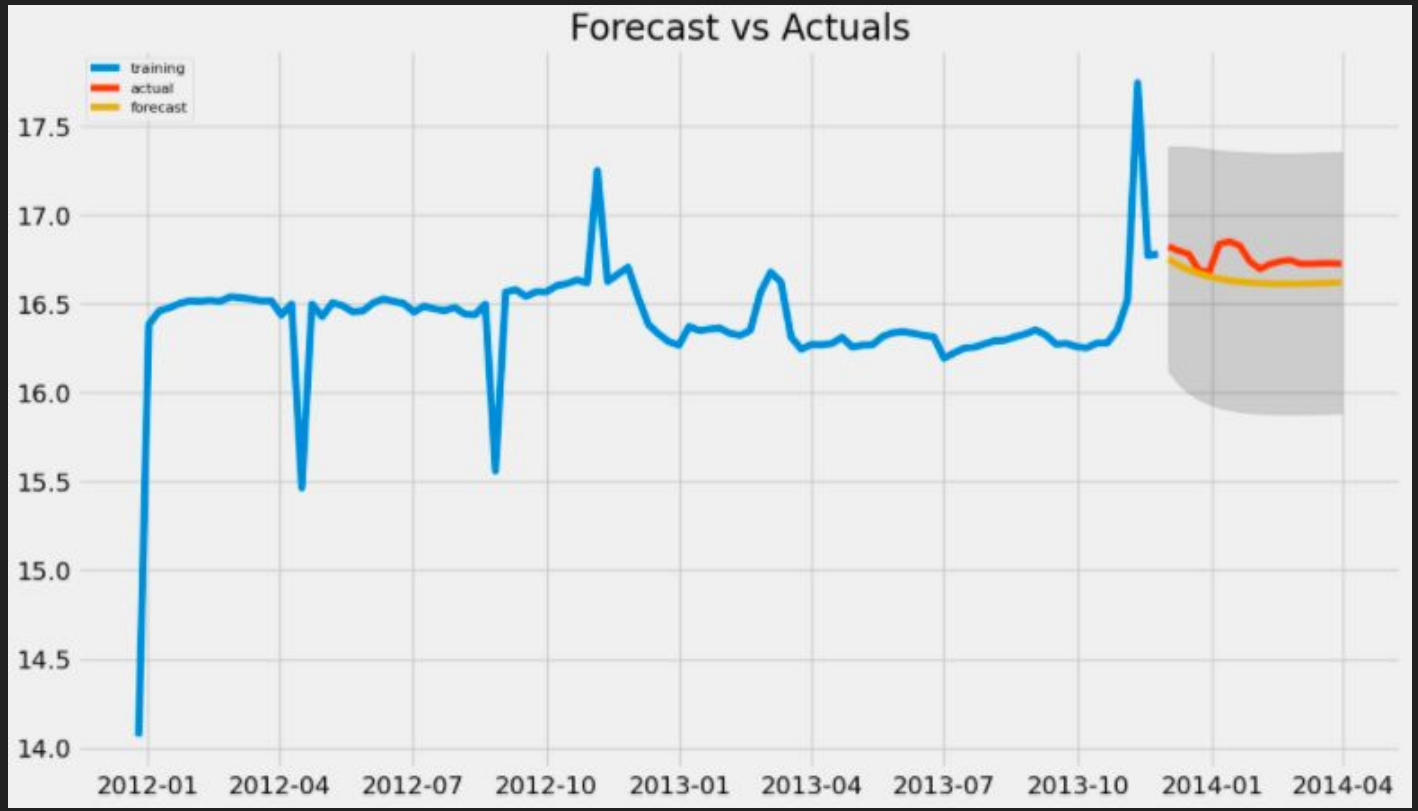
PACF and ACF to find ARIMA (p,d,q) values



ARIMA (1,1,2) Fit

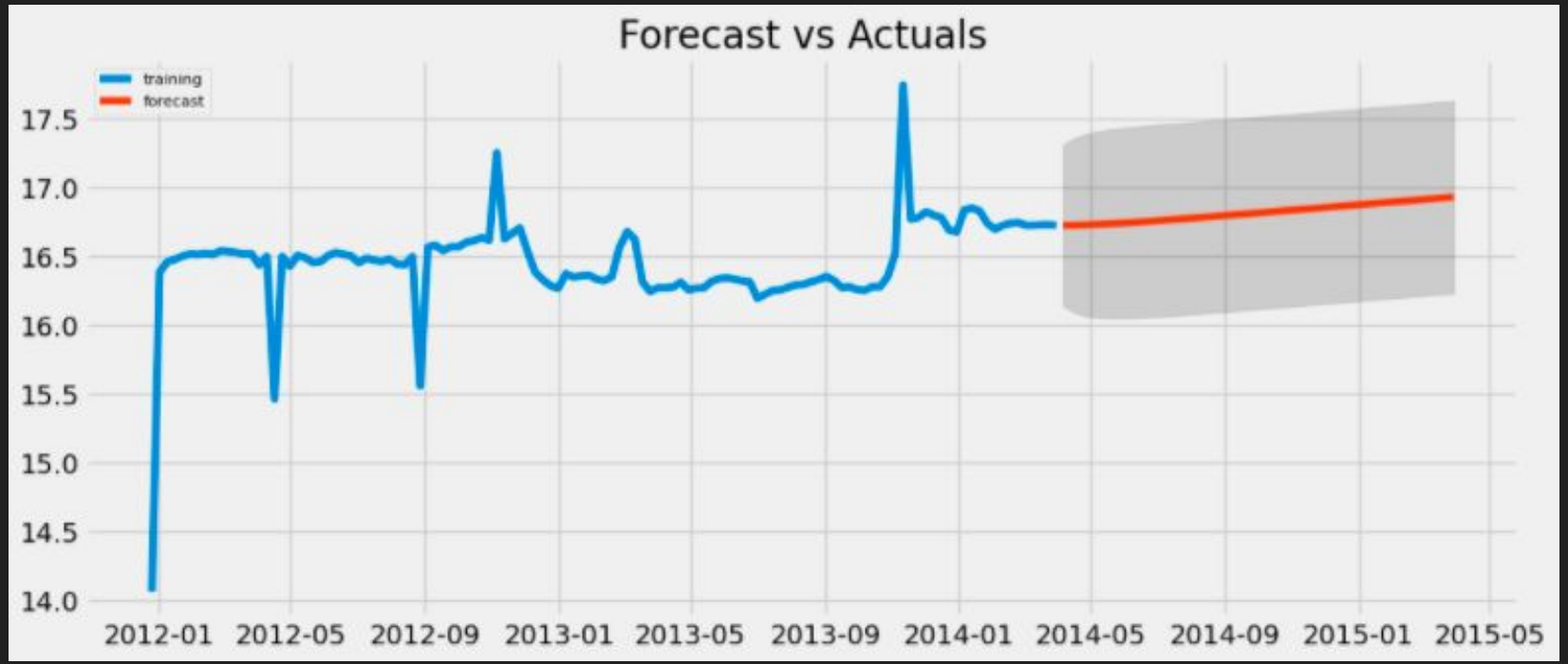


ARIMA (1,1,2) Forecast on test data

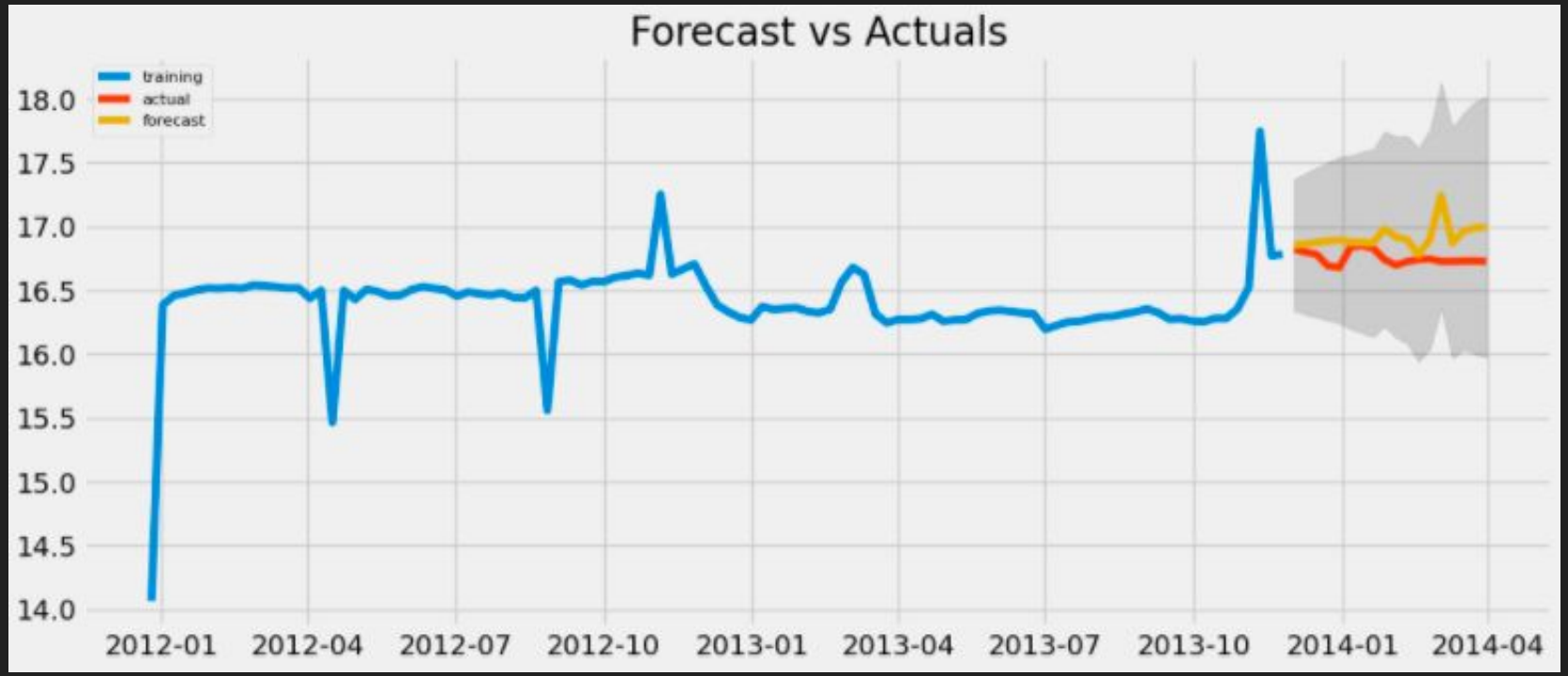


ARIMA (1,2,2) Forecast on test data

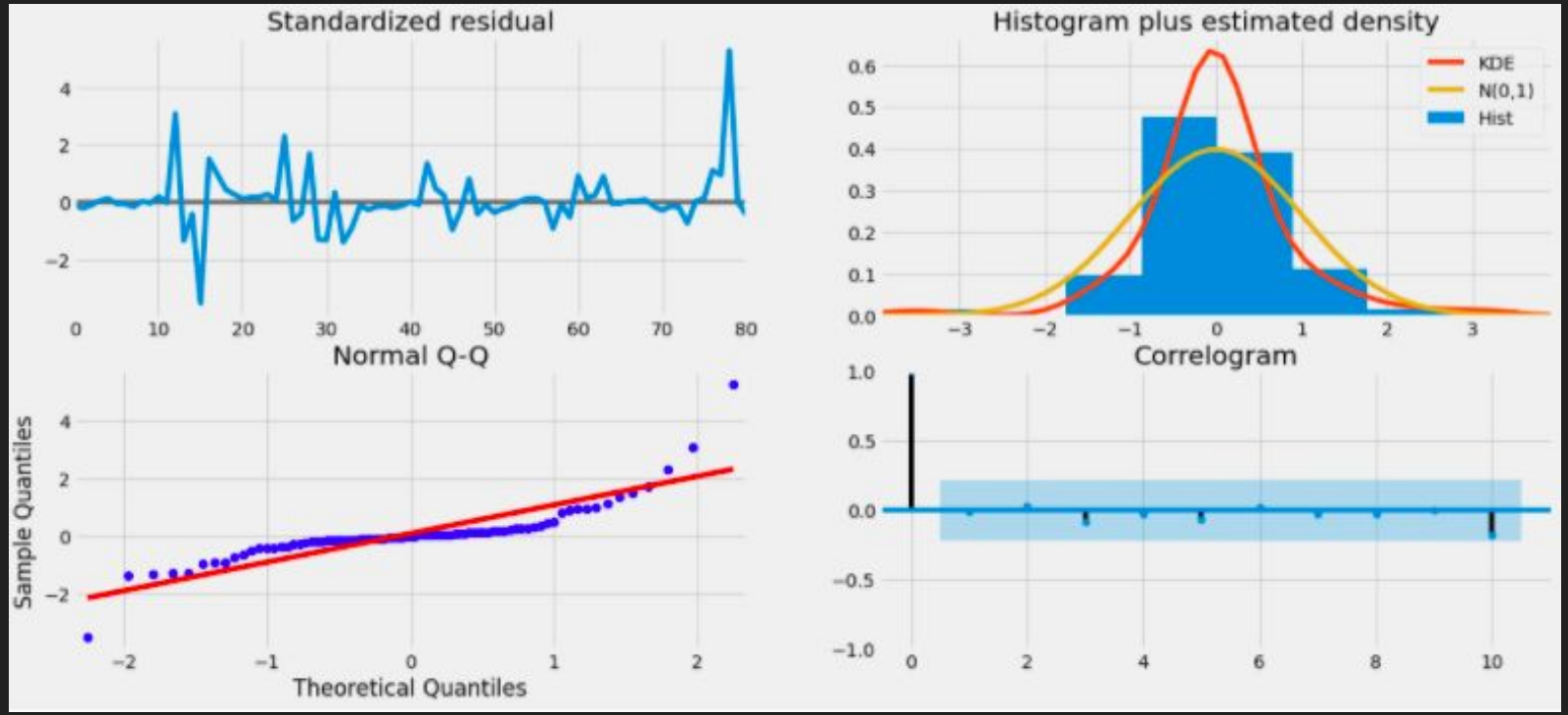
ARIMA (1,1,2) forecast for next year - Minimum Error



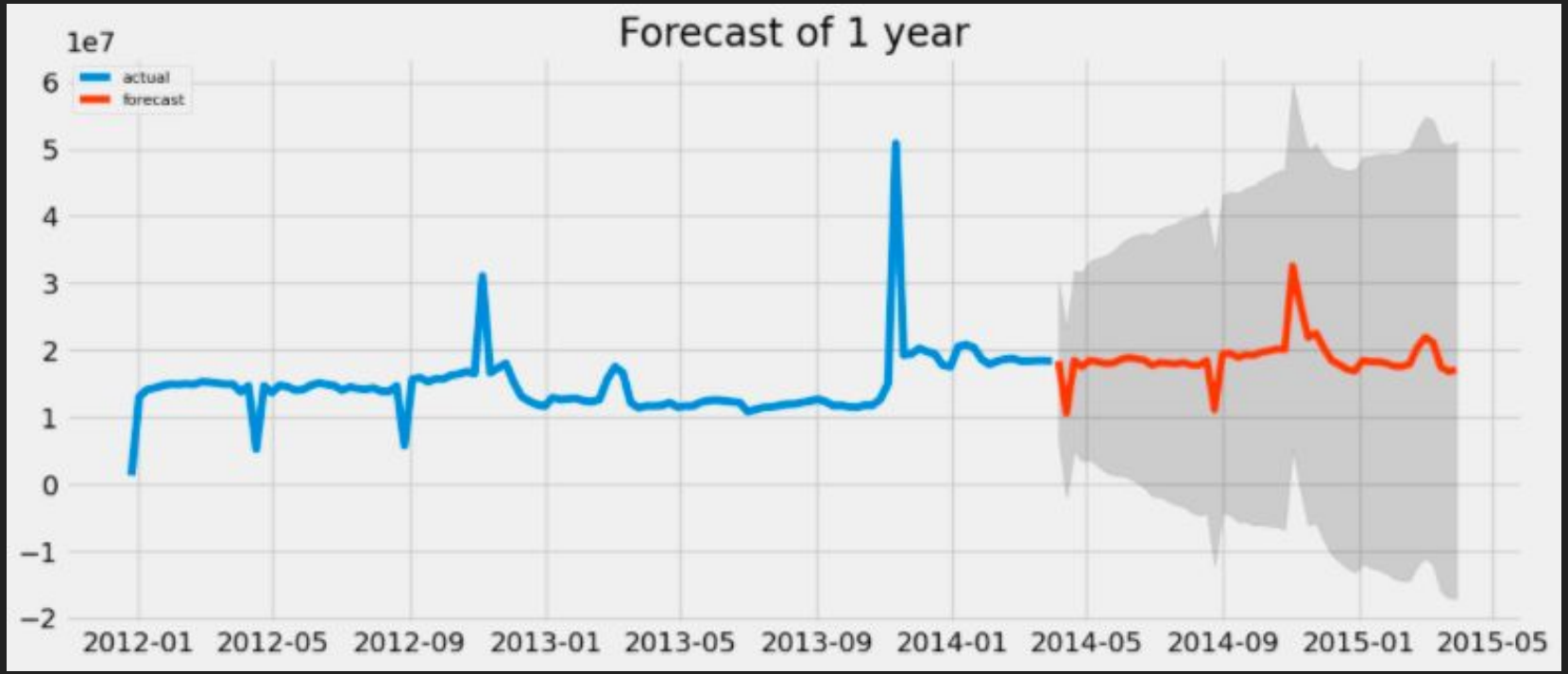
SARIMAX model forecast on test data (Seasonality-16)



SARIMAX(16) Residual Plots



Final Model - SARIMAX(52) forecast (95% Confidence Interval)



Ending Points

The final model depends on how we want our predictions, if we want the error to be as small as possible, then we can go ahead with ARIMA(1,1,2), if we want to check the highs and lows in our data, then we can stick with SARIMAX(52).

If we had more data, we could have predicted the seasonality more accurately as there is some seasonality after 4 months in 2012-2013, and a significant 1 year seasonality in 2012-11 and 2013-11.

For our Final model we selected SARIMAX(52) with 1 year seasonality due to the sharp spike in November.

Thank You! Any Queries?