Reliance Stock Price Forecasting

GROUP MEMBERS: -

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PROBLEM STATEMENT: - The problem is to forecast closing stock price on the basis of past trend of price for Reliance industries.

DATA COLLECTION :- The data is collected from YAHOO Finance website.

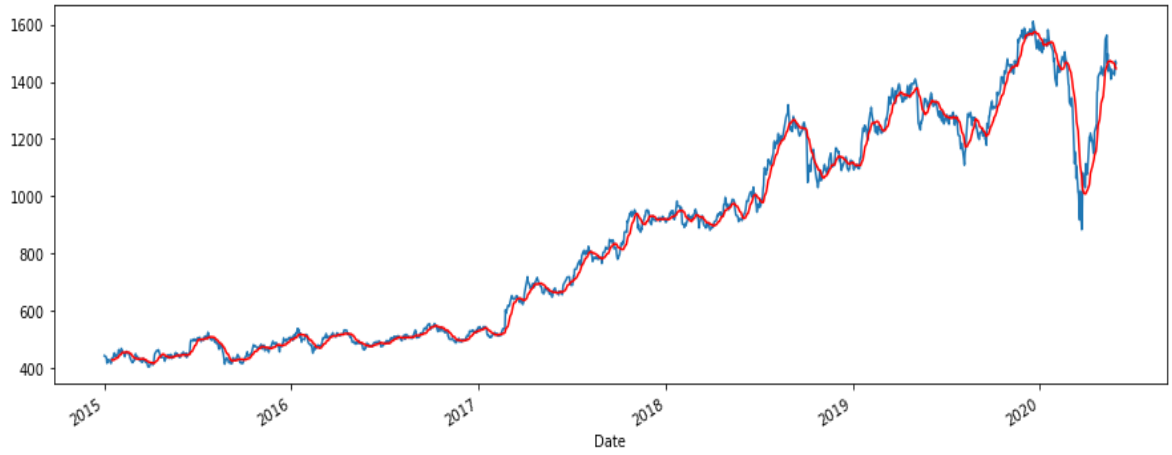
DATA PREPROCESSING: - The data contains opening price, closing price, high value, low value and volume for last 5 years (2015-20). We removed the missing value using forward fill technique. We have also decomposed trend seasonality and residual.

We have divided our dataset into Training and Testing part in the ratio of 90:10

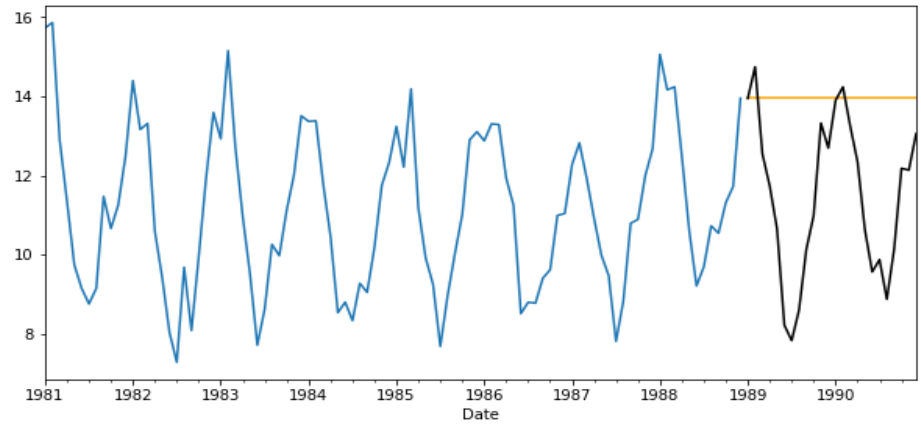
Models Applied :-

1. Moving Average Technique
2. SimpleExpSmoothing
3. Exponential Smoothing
4. ARIMA
5. Auto ARIMA

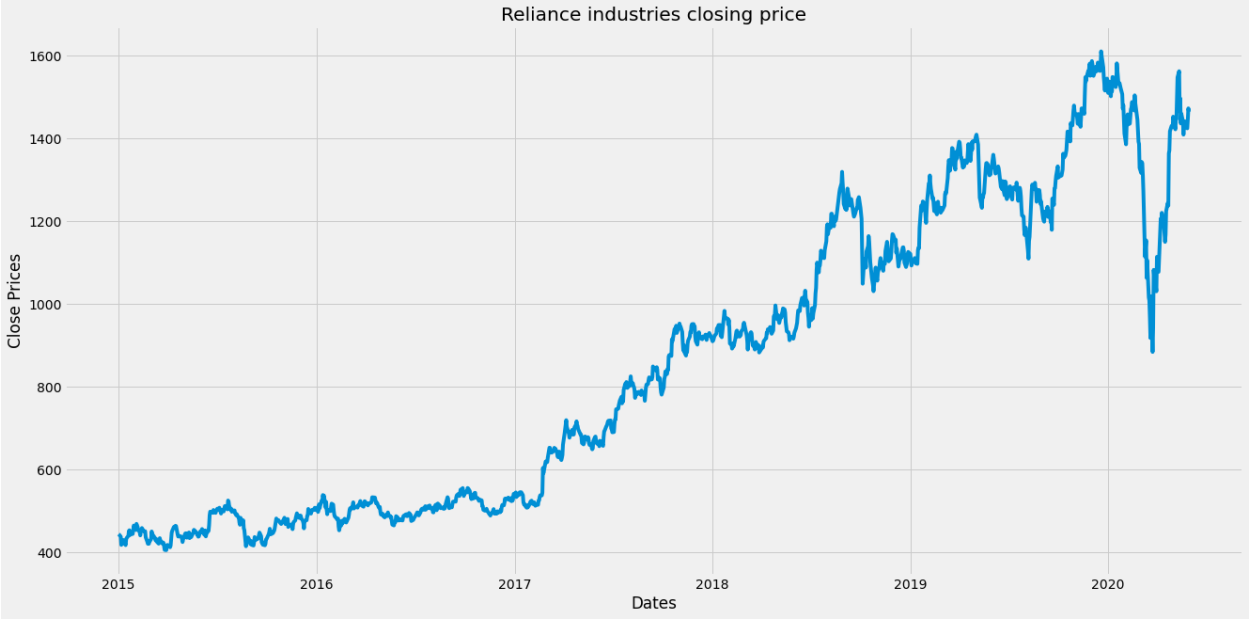
- **Moving Average Technique: -** The moving average (MA) is a simple technical analysis tool that smooth out Closing Price by creating a constantly updated average temperature.



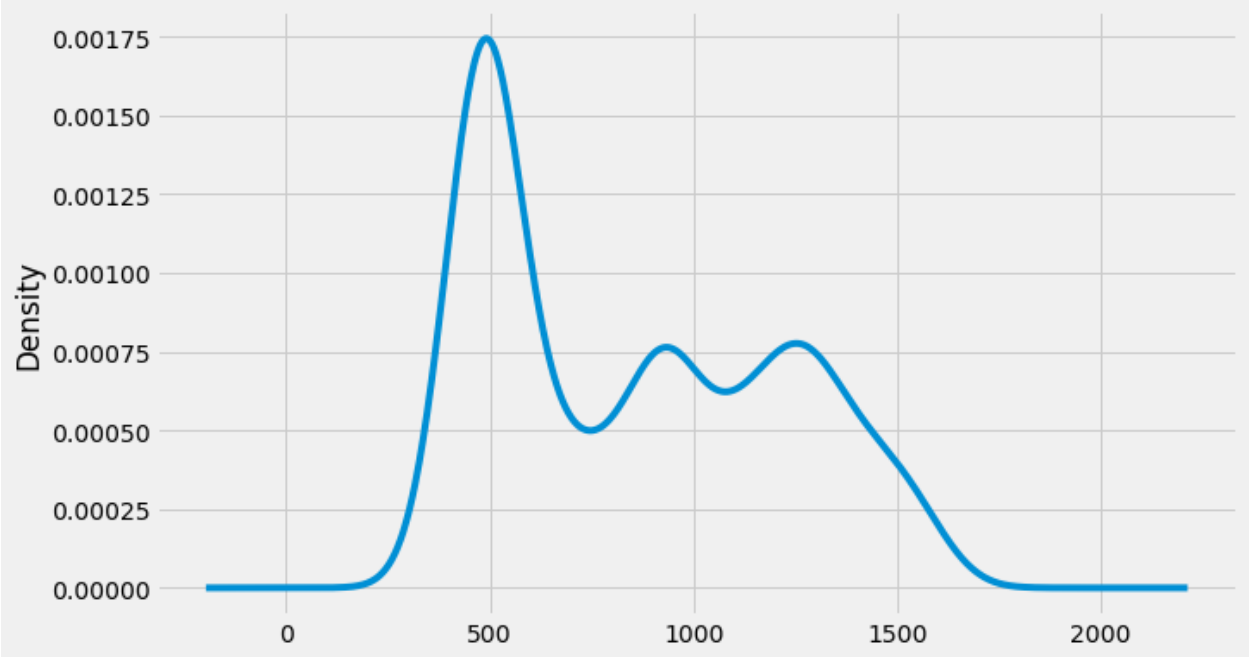
- **Exponential Smoothing :-** It repeats the last value of the pattern which depends on our previous one instance .



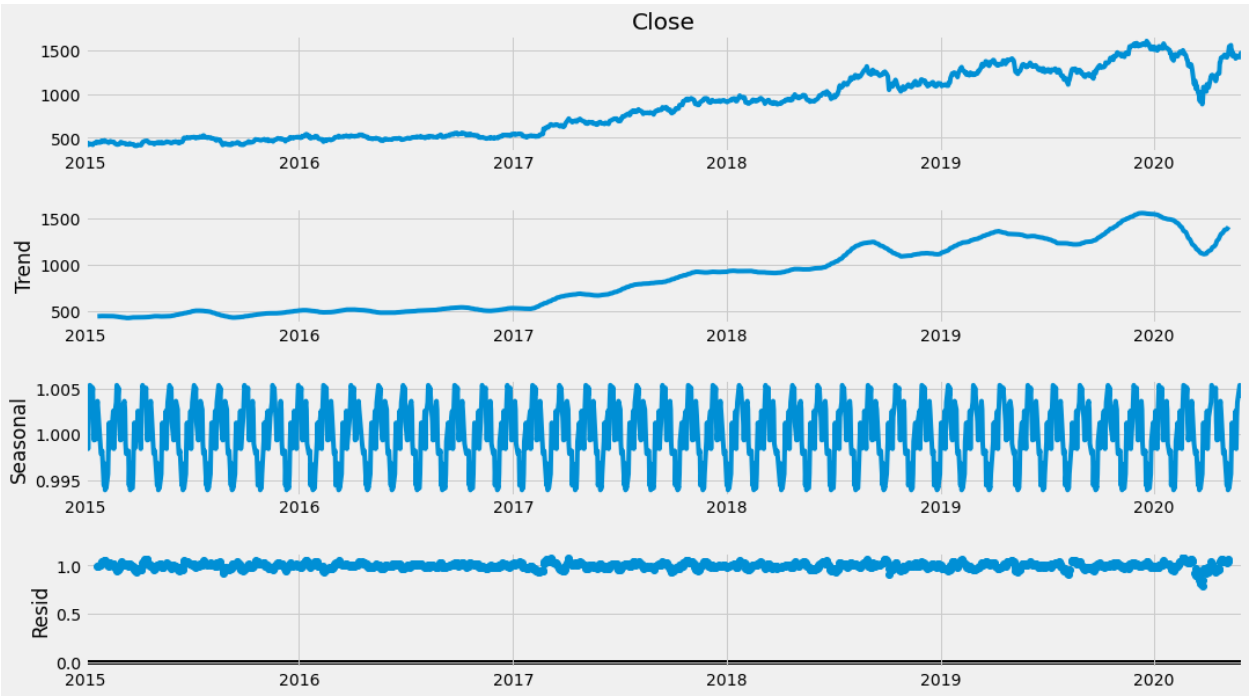
ORIGINAL STOCK PLOT



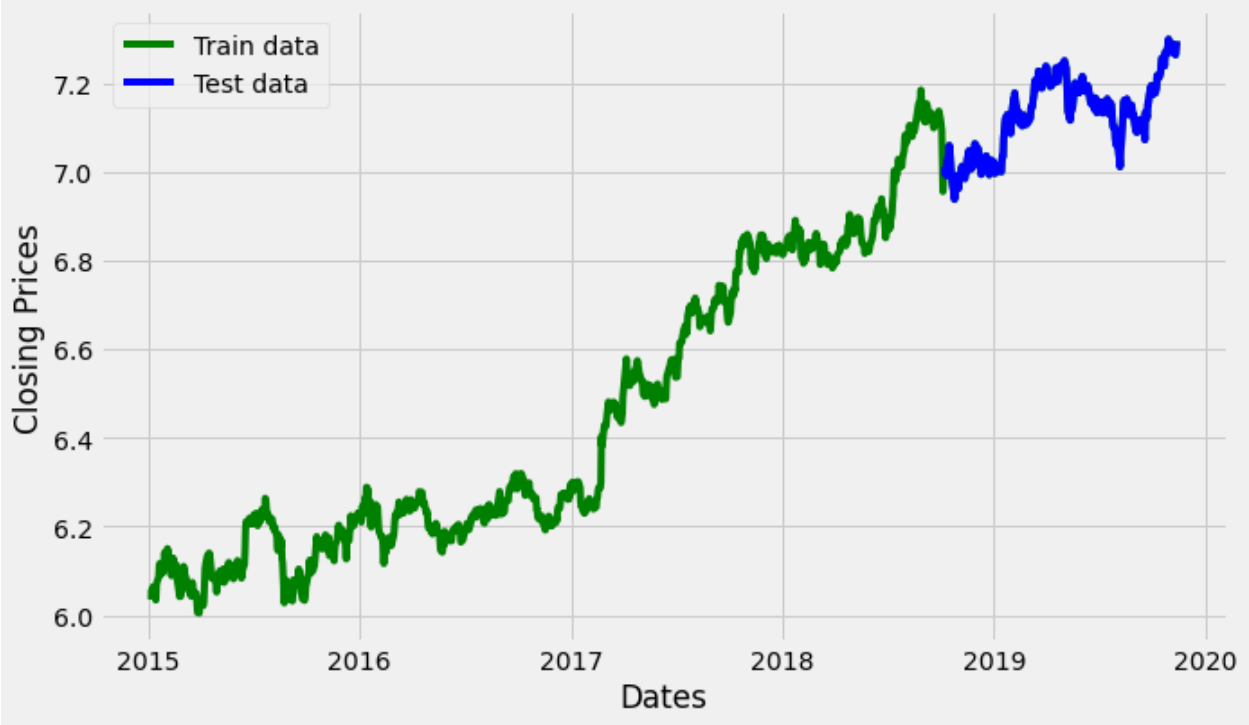
DENSITY PLOT



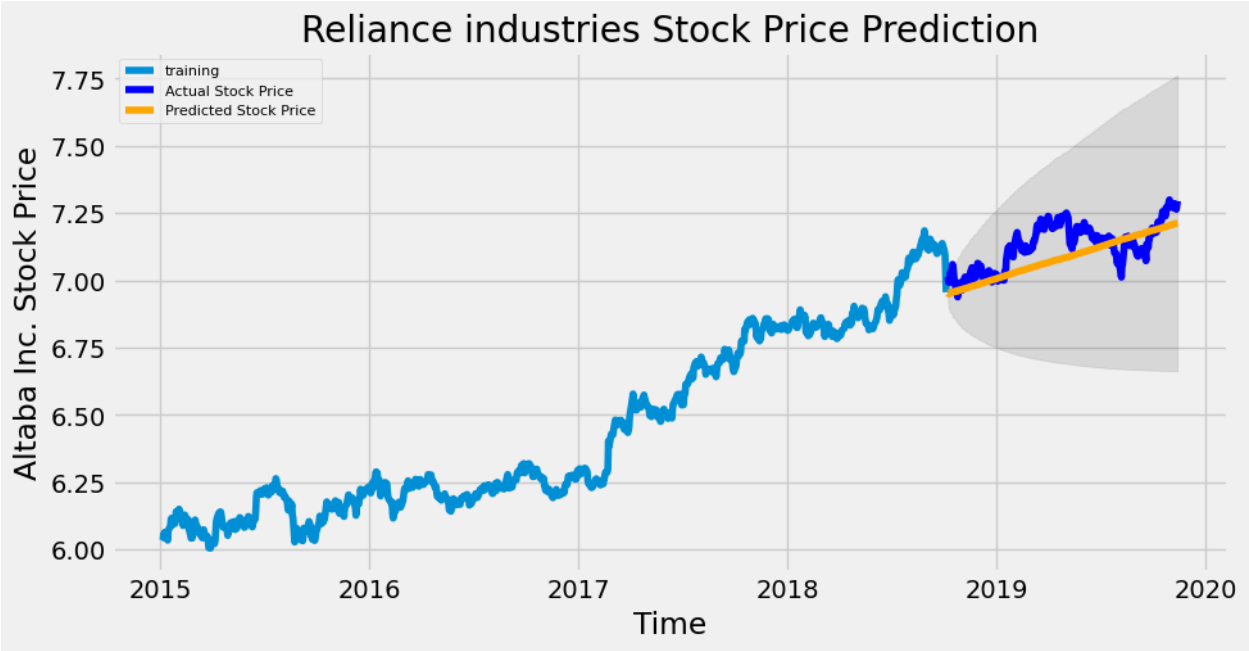
WITHOUT LOG:



TRAIN TEST SPLIT:



MOVING PRICE:



Model Diagnostic :- We should always run model diagnostics to investigate any unusual behavior. The **plot_diagnostics** object allows us to quickly generate model diagnostics and investigate for any unusual behavior. In this case, our model diagnostics suggest that the model residuals are normally distributed based on the following:

- **Standardized Residual, Correlogram, Histogram plus estimated density, Normal QQ-plot :-**

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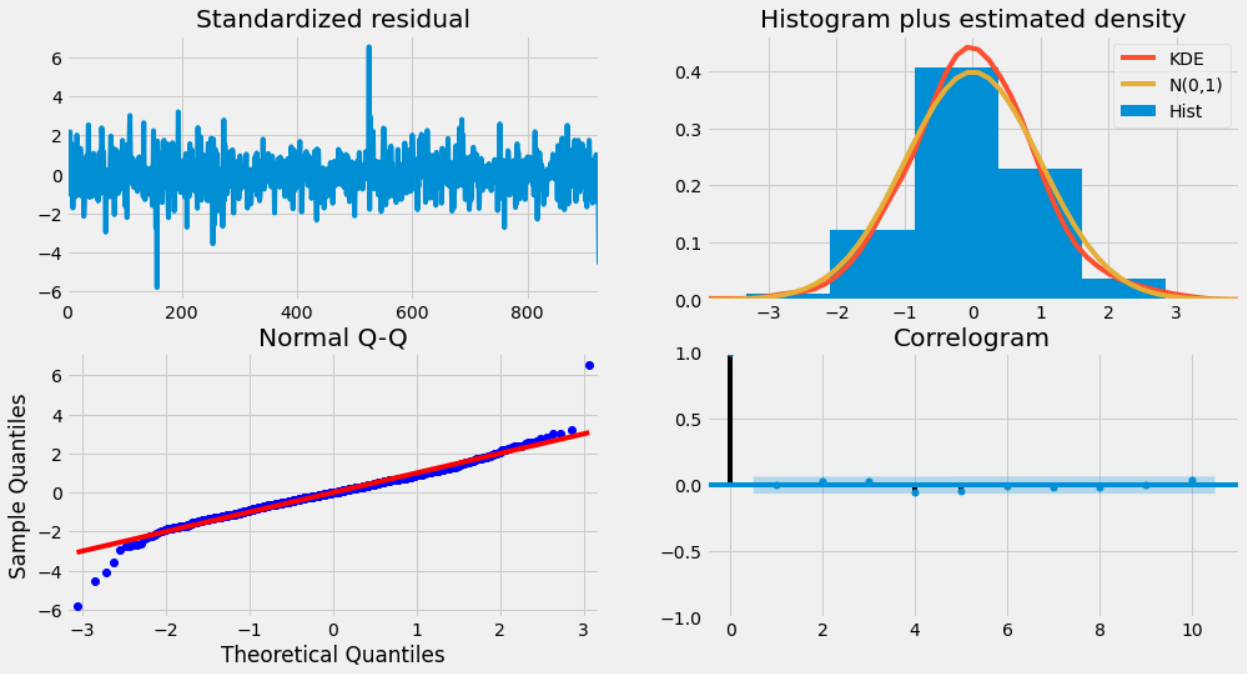

<u>Conclusion :-</u> The residuals over time do not display any obvious seasonality and appear to be white noise. This is confirmed by the autocorrelation (i.e. correlogram) plot on the bottom right, which shows that the time series residuals have low correlation with lagged versions of itself. In the above plot, we see that the red KDE line follows closely with the N(0,1) line (where N(0,1)) is the standard notation for a normal distribution with mean 0 and standard deviation of 1). This is a good indication that the residuals are normally distributed.

The qq-plot shows that the ordered distribution of residuals (blue dots) follows the linear trend of the samples taken from a standard normal distribution with N(0, 1). Again, this is a strong indication that the residuals are normally distributed.

WE CAN SAY THAT AUTO ARIMA MODEL BEST FITS OUT OF ALL MODEL.