Problem Statement: Analysis of the Tesla stock Price:

Analysis :

1. Data frame contains the data of the stock Tesla from the Yahoo finance for last years. it has total of 1260 days of the data with independent column as Day's High, Day's Low, open price, close price, and volume of the stock traded on that day. Data is clean and does not contain any null and empty values.
    a. Data looks like below

Date	High	Low	Open	Close	Volume	Adj Close
2017-06-19	75.339996	73.559998	75.000000	73.959999	32746500.0	73.959999
2017-06-20	75.776001	73.945999	75.334000	74.447998	37193500.0	74.447998
2017-06-21	75.398003	73.603996	74.870003	75.279999	24616000.0	75.279999
2017-06-22	77.000000	74.713997	75.598000	76.522003	37649000.0	76.522003
2017-06-23	77.398003	75.870003	76.489998	76.690002	32229000.0	76.690002

    b. Description of Data

	High	Low	Open	Close	Volume	Adj Close
count	1260.000000	1260.000000	1260.000000	1260.000000	1.260000e+03	1260.000000
mean	334.159315	318.347337	326.628126	326.469869	4.438044e+07	326.469869
std	353.316029	336.140924	345.297097	344.816788	3.009465e+07	344.816788
min	37.335999	35.397999	36.220001	35.793999	9.800600e+06	35.793999
25%	63.389000	60.994999	62.452501	62.313499	2.523975e+07	62.313499
50%	77.706997	74.946999	76.088001	76.606003	3.451500e+07	76.606003
75%	670.425018	641.382492	659.957489	657.914993	5.156662e+07	657.914993
max	1243.489990	1217.000000	1234.410034	1229.910034	3.046940e+08	1229.910034

2. Adj Close and Close are exactly same data and are highly correlated image, hence dropping the Column Adj Close
3. Correlation Graph of the feature:

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sns.heatmap(corr,)
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<AxesSubplot:>
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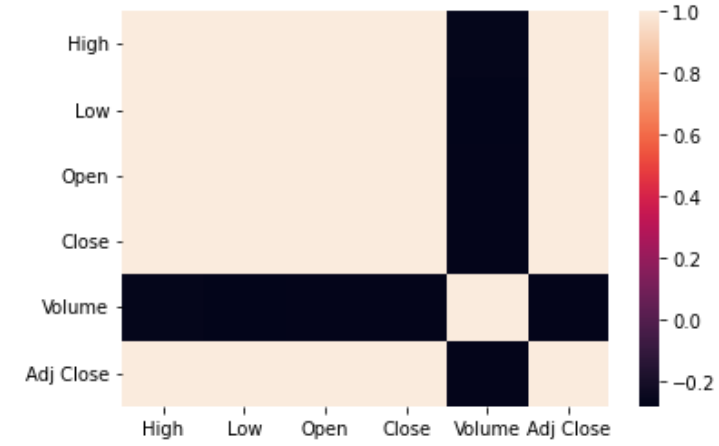


4. Stock was at min Price on Below date:

Date	High	Low	Open	Close	Volume
2019-06-03	37.335999	35.397999	37.102001	35.793999	65322000.0

Tesla stock price was lowest on 3rd June 2019 because the news. Wall Street on concerns about demand for its vehicles and the company's financial health. Reference of the above news is from https://www.marketwatch.com/story/tesla-stock-nears-a-three-year-low-2019-06-03

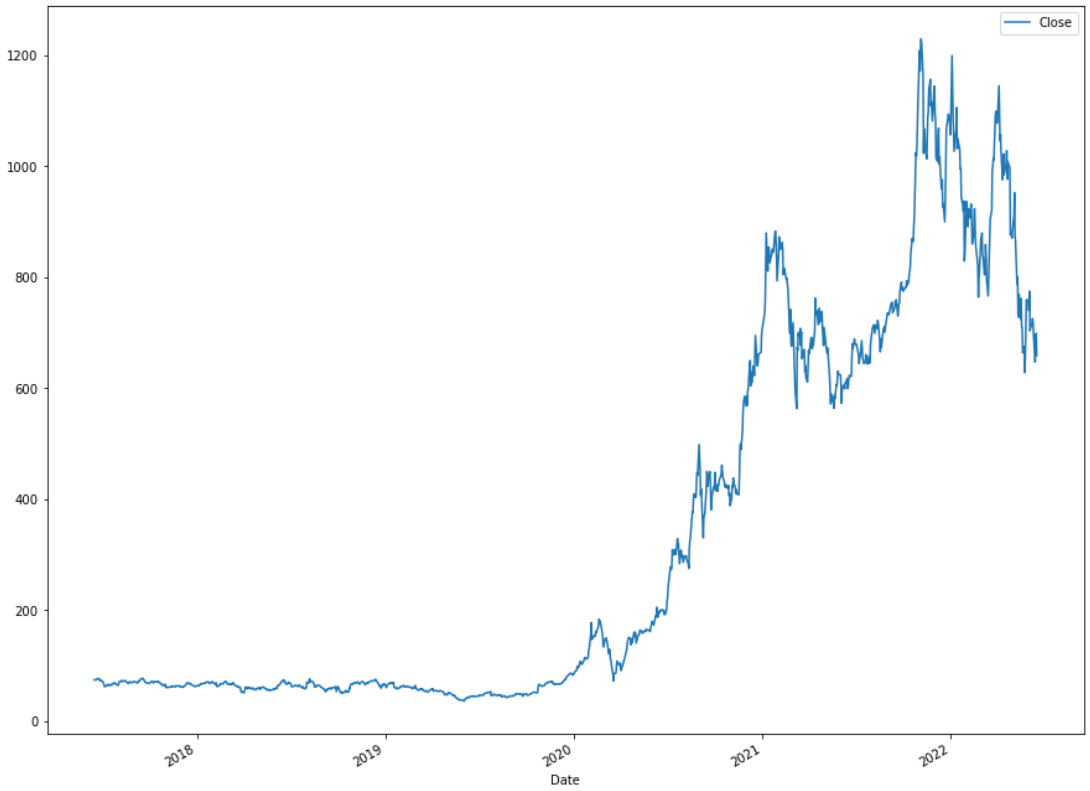
5. Stock was at Max Price on below date:

Date	High	Low	Open	Close	Volume
2021-11-04	1243.48999	1217.0	1234.410034	1229.910034	25397400.0

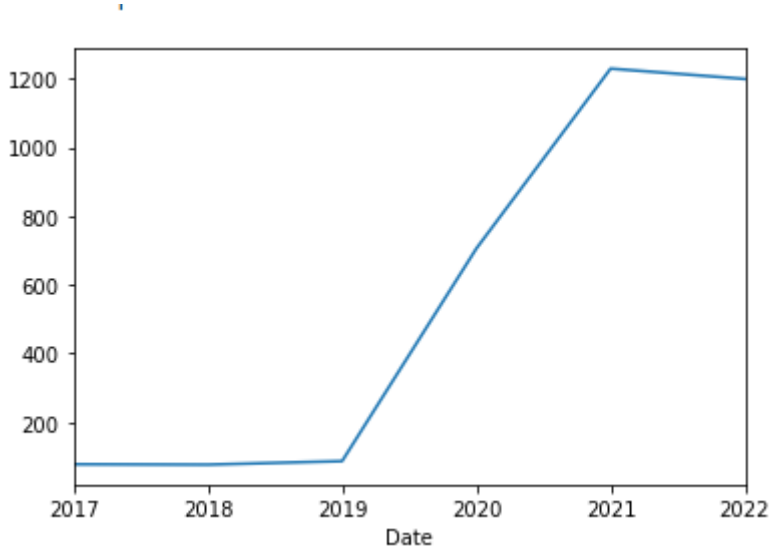
Tesla Stock Price touched it's all-time high price on 4th Nov 2021. stock reached the highest level because of the quarterly result. Reference from https://www.wsj.com/articles/tesla-shares-jumps-premarket-after-record-earnings-11650539385

6. min volume and max volume of the stock was on 11 Aug 2021 and 04 Feb 2020 respectably

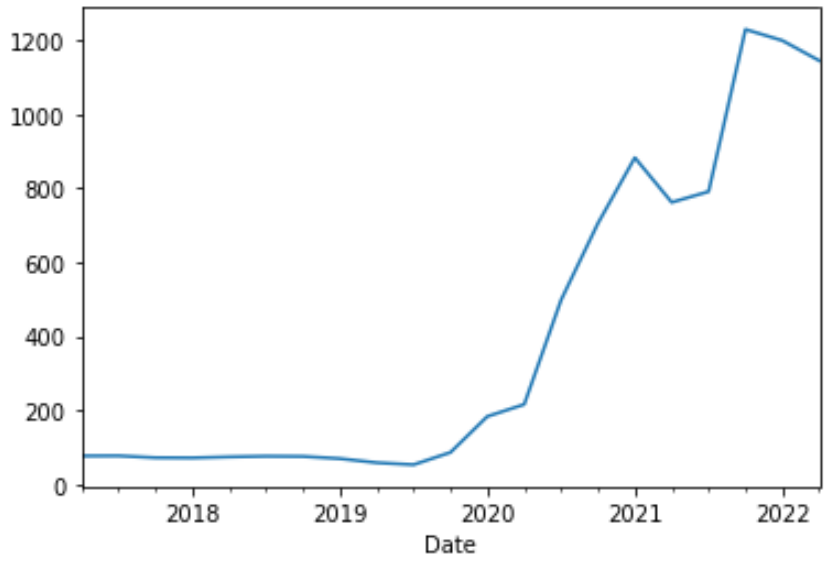
7. Price Changes “Close Price” on the Graph from the 2017 to 2022



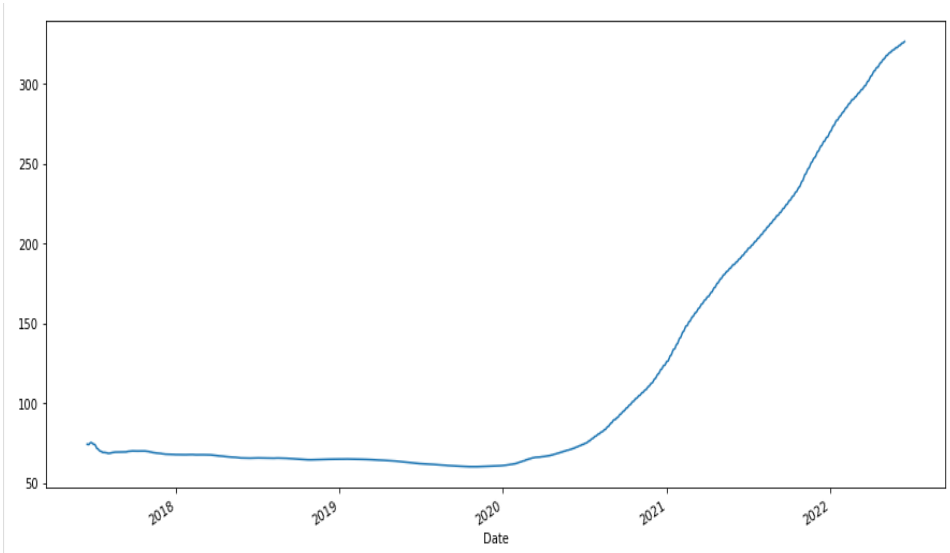
8. There was a Sharpe Change in the price was observed between the time frame of 2019 to 2021



9. On digging deep, it is observed The Price from 2020 Q2 to Q4 of 2020 the price is 4 times in just span of 8 months

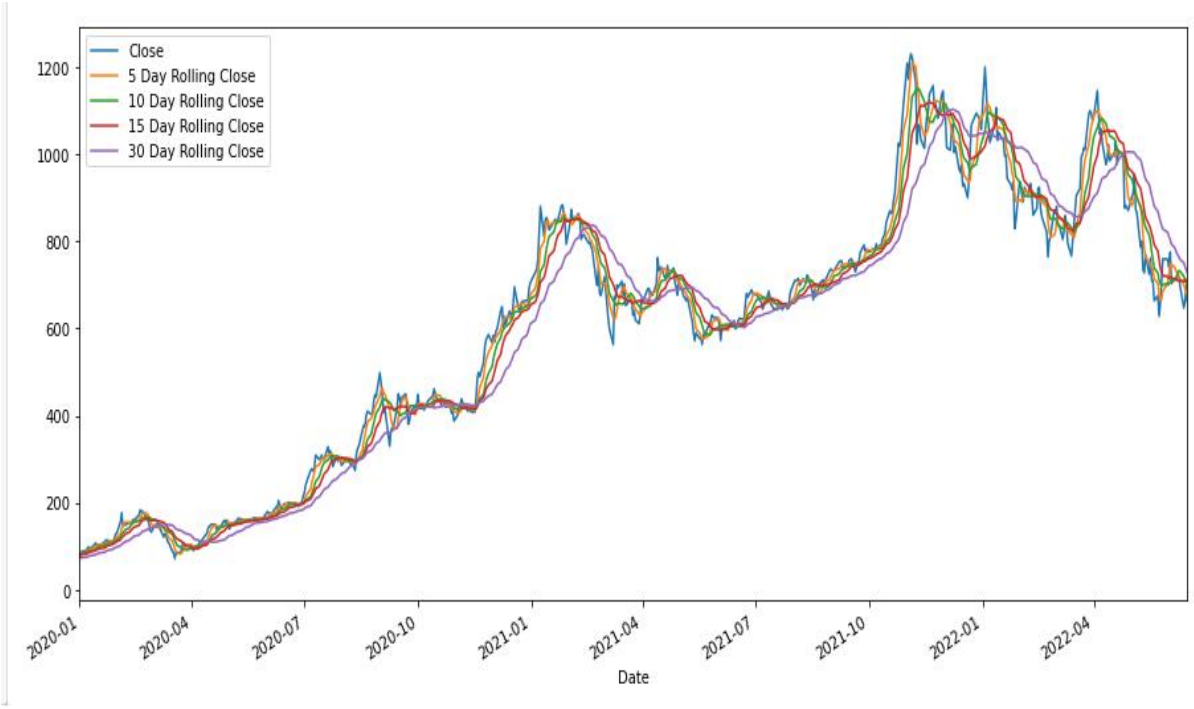


10. Cumulative Price Movement as



There is a sharp price increase from the mid of the 2020 to start of 2022

11. It is observed the when the close price touches the 30-day moving average it moves upwards.



12. With adfuller test we are able to find out that the data is not stationary

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Data is not stationary null hypthisis is accepted p= 0.7774271219792074
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13. After calculating the 1st difference, the data is stationary:

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Data is stationary, alternate Null hyposthis is accepted p= 1.6024993432152303e-08
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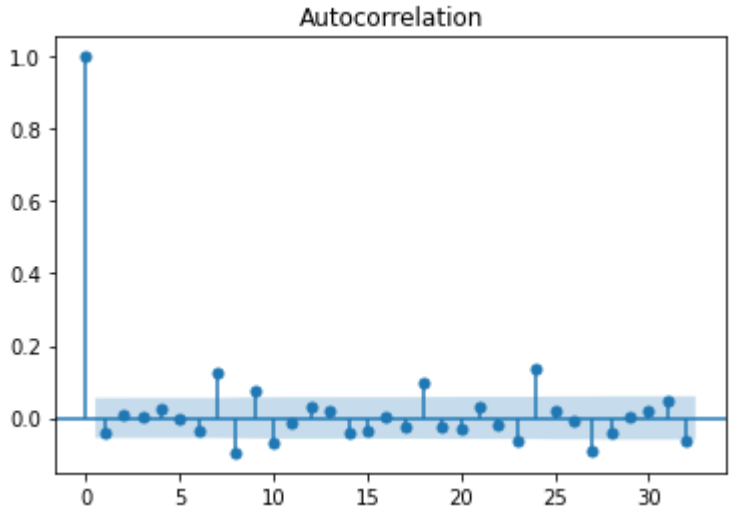
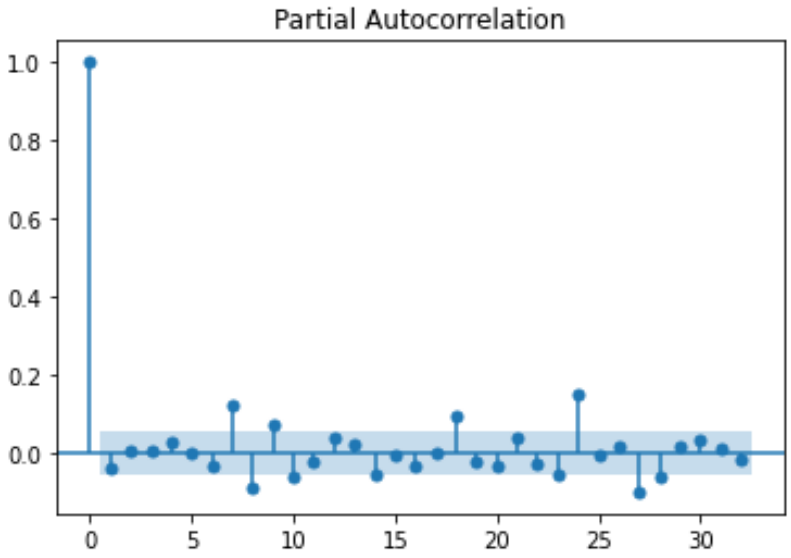
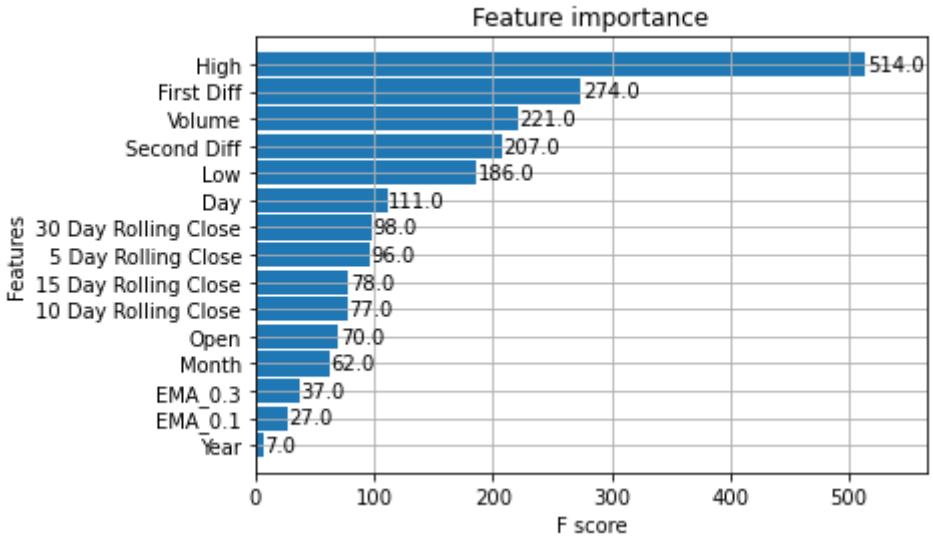
14. Drawing the Auto Correlation of the data: q=7 is observed from the below graph



15. Drawing the Partial Auto Correlation of the data : p=7 is observed from the graph



16. The above P and Q values can be used for the ARIMA model for forecasting the values.
17. Feature which are directly impacting the Closing Price are as below:



For forecasting the future price we can take the features as High, First Diff, Volume, Second Diff, Low, Day and 30 day rolling moving average.