YES BANK STOCK CLOSING PRICE PREDICTION

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ML CAPSTONE PROJECT-2

ALMABETTER ,BANGLORE

ABSTRACT:

- Stock market I characterized as unpredictable and non linear in nature . so accurate prediction of stock market is very challenging task due to its non-linear nature.
- In this work of prediction different regression technique has been utilized for predicting the next day closing price for the bank or company belonging to finance sector of operation .
- We have used Open ,Close, High ,Low prices of stock as inputs to the model.
- RMSE and MAPE is used for model evaluation.
- The low values of these two indicators show that the models are efficient in predicting stock closing prices.

PROBLEM STATEMENT:

- Prediction of yes bank stock closing price.
- Perform regression analysis using multiple models to predict the closing price of stock and compare evaluation metrics for all of them to find best model.
- Getting accuracy of several machine learning model.

DATA SUMMARY:

Given dataset has monthly stock prices of the bank since its inception and includes closing, starting, highest and lowest prices of every month. The main objective is to predict the stock's closing price of the month.

Dataset contains following features;

- Date : it denotes the month and year of investment.
- Open: the price of stock when stock market is open for the day.
- Close: the price of stock when stock market is close for the day.
- High: the price of stock is maximum during the given time.
- Low: the price of stock is minimum during the given time.

INTRODUCTION:

- Yes Bank is a well known bank in the indian financial domain. Since 2018, it has been in the news because of the fraud case involving Rana Kapoor .owing to this fact, it is interesting to see how that impacted the stock prices of company and whether time series model or any other predictive models can do justice to such situations.
- Stock price prediction using machine learning helps us to discover the future value of company stock and other financial asset traded on an exchange .

STEPS INVOLVED IN PREDICTION:

- Loading data

Before doing exploratory data analysis or building any machine learning model, it is very important to find what the data is and what operation we are going to perform on it.so first we have loaded the dataset. After processing the data we will apply ML algorithms.

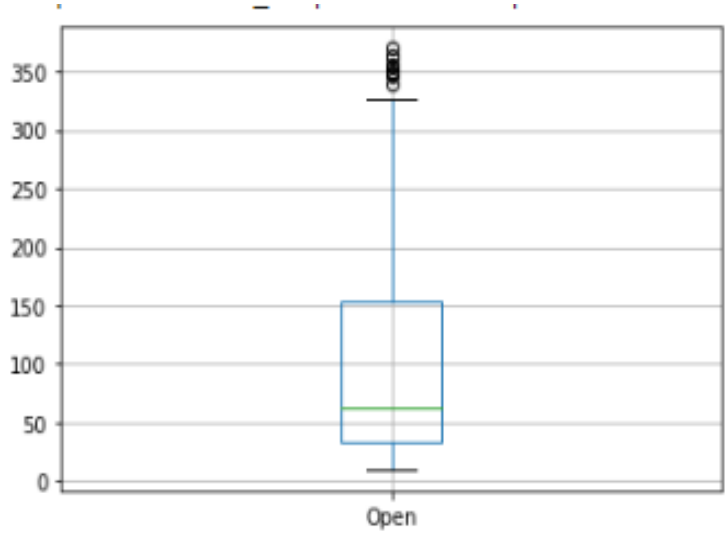
- Data cleaning

Dataset contains int64, float64, datetime64 type of data. Data cleaning was easy in this type of dataset.

- Exploratory data analysis(EDA)

After data cleaning we perform exploratory data analysis .EDA part makes more clear about the data in a picture and graphical form. Mainly we perform matplotlib and sea born libraries of python for the data analysis.

*Checking outliers: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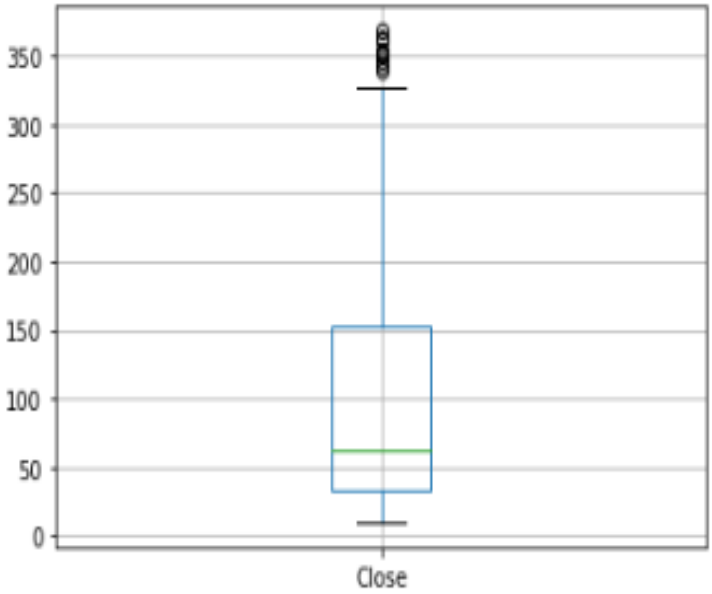
Open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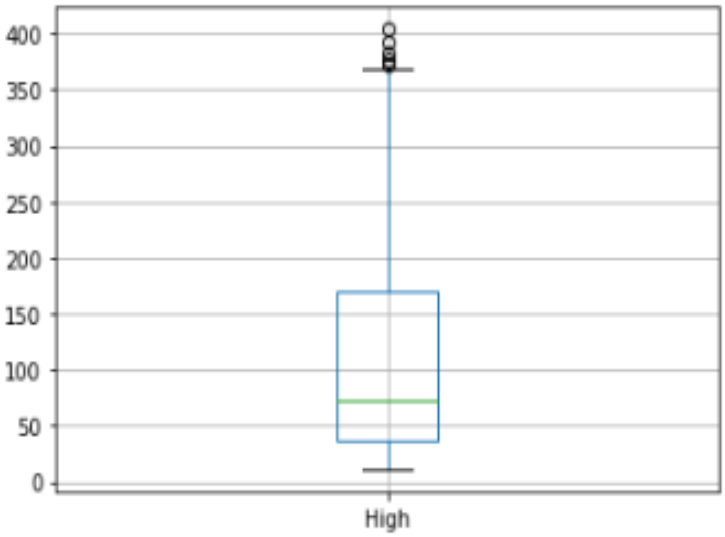
Close


400
350
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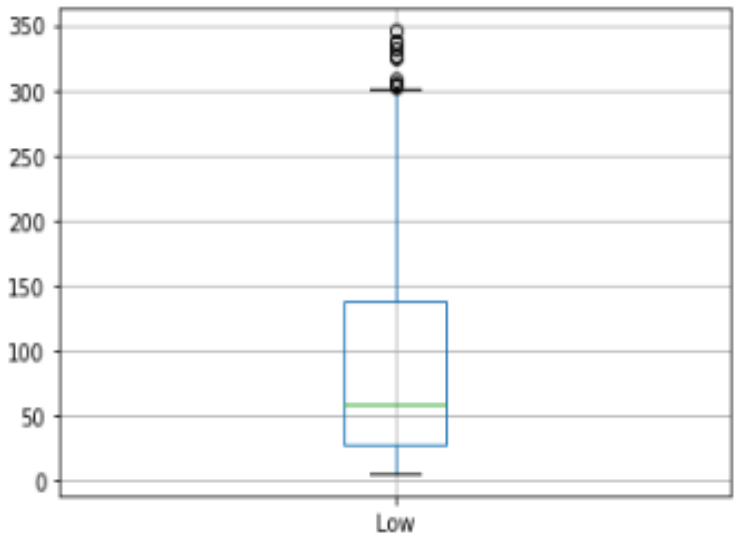
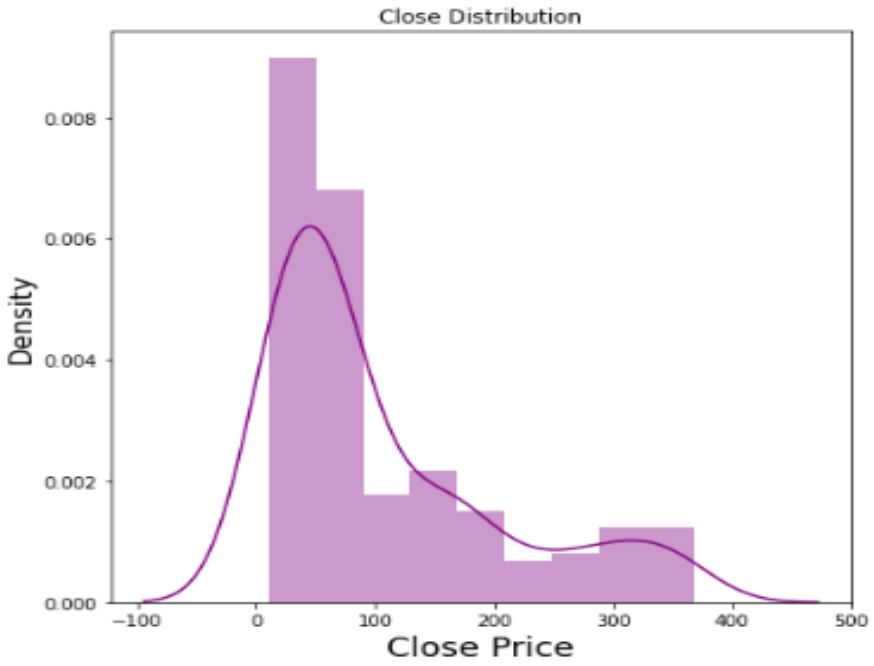
50
0
High

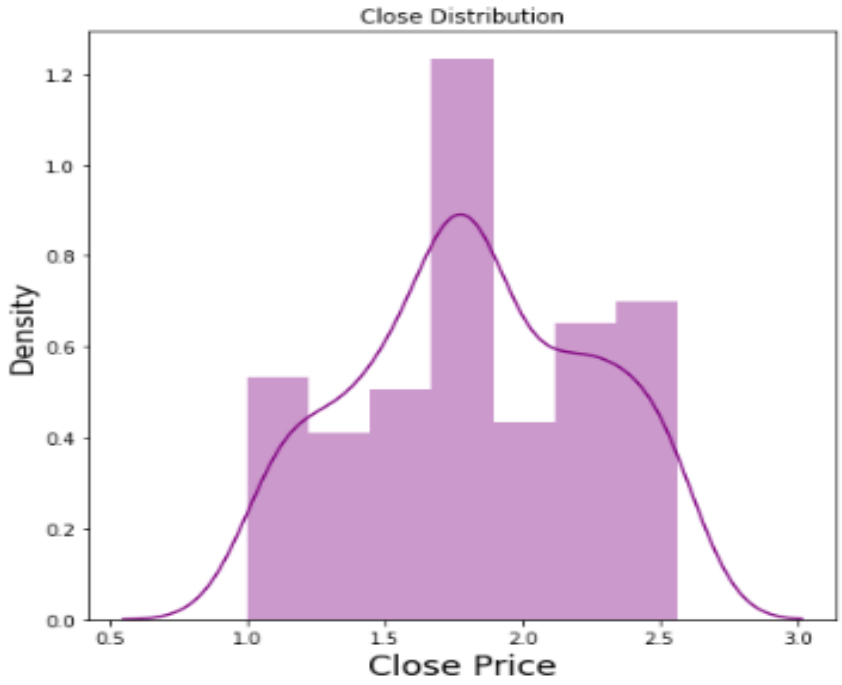


- Exploratory data analysis/ data processing

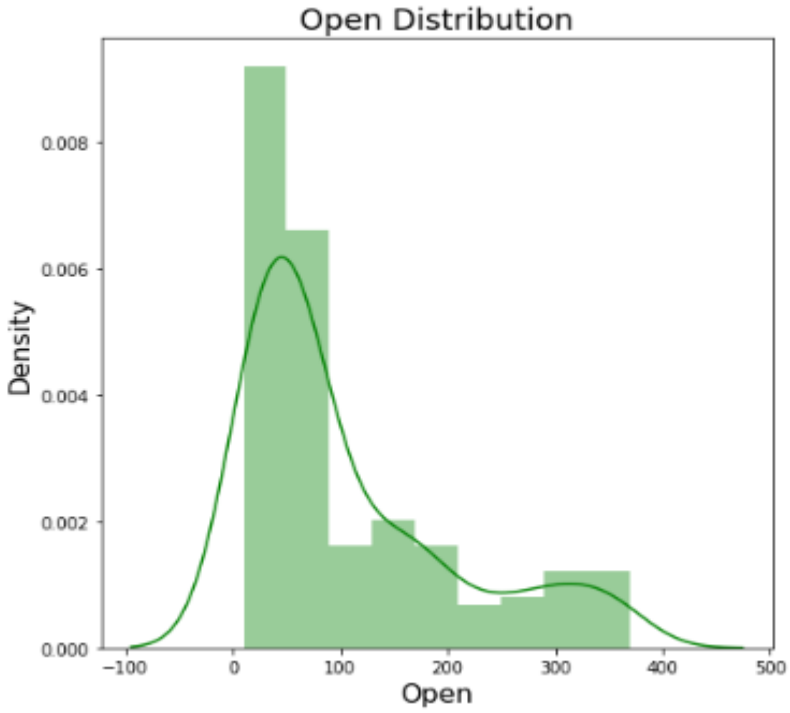
Exploratory data analysis is an approach of analyzing the datasets to summarize their main characteristics , often using statistical graphics and other data visualization method.

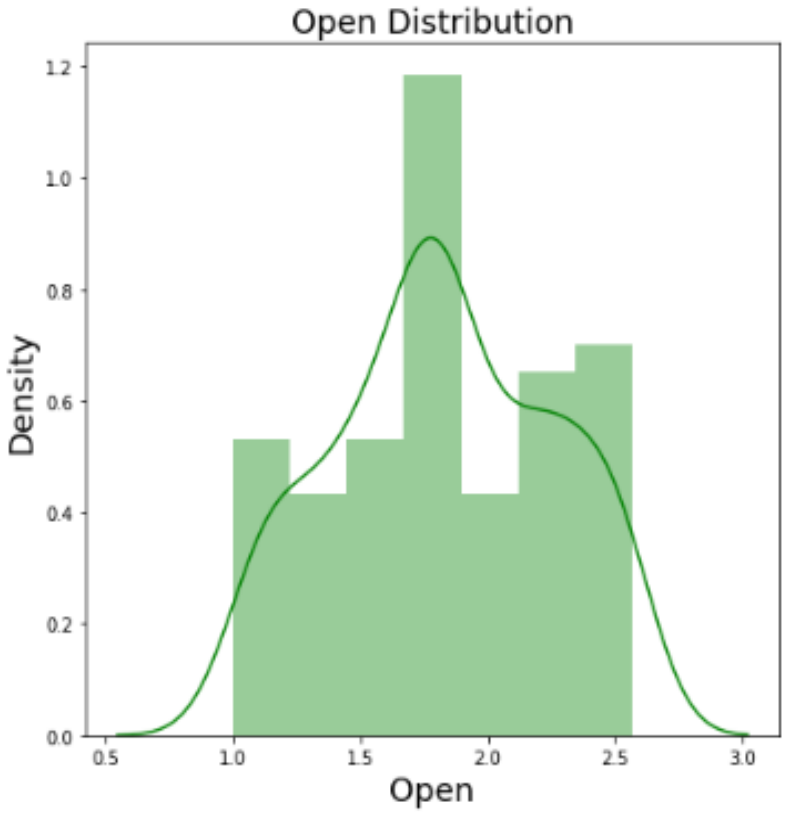
Dependent variable of close price stock:





Independent variable of Open, High ,and Low price of stock:




Open Distribution
Density
Open
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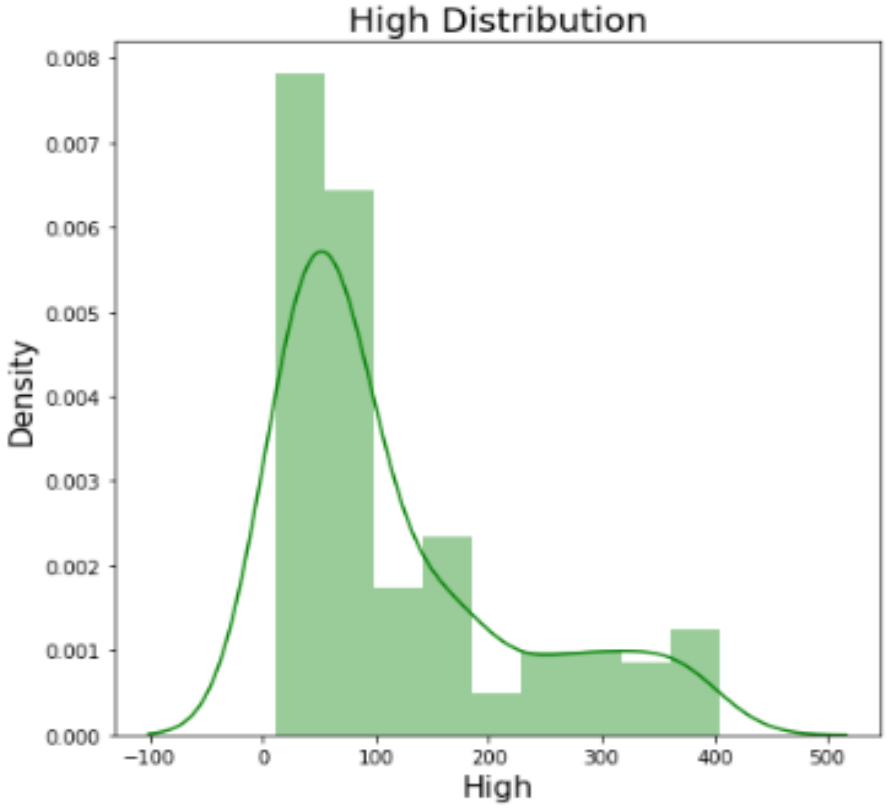
1.0
0.8
0.6
0.4
0.2
0.0
0.5
1.0
1.5
2.0
2.5
3.0


High Distribution
Density
High
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0.007
0.006
0.005
0.004
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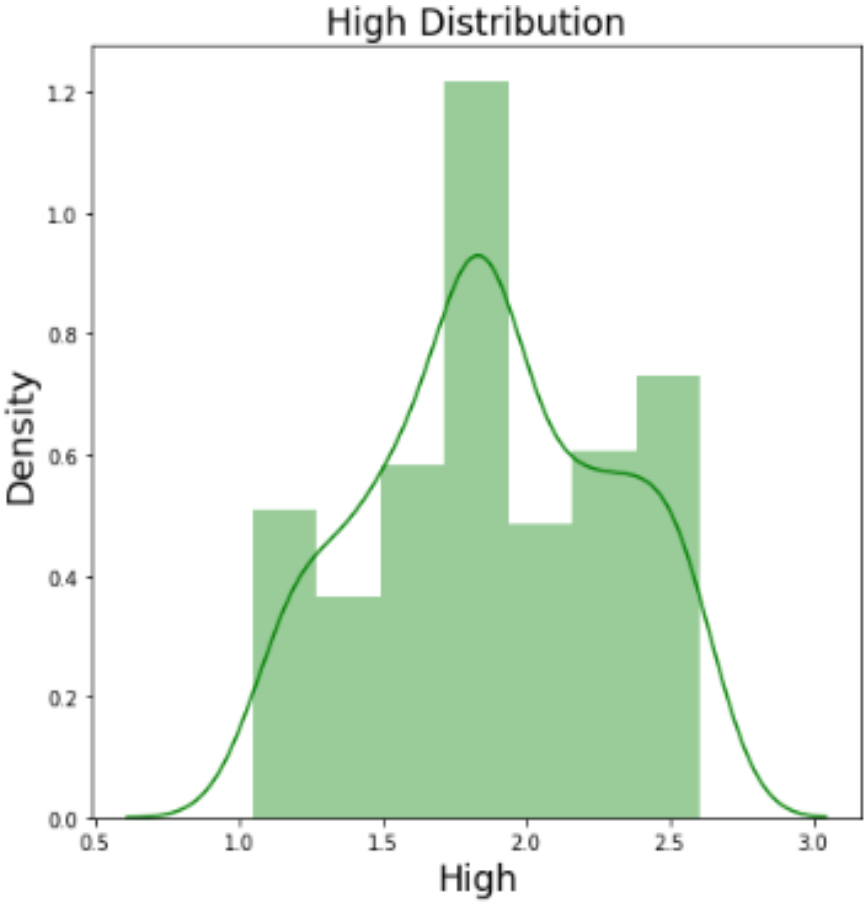
500


High Distribution
Density
High
0.0
0.2
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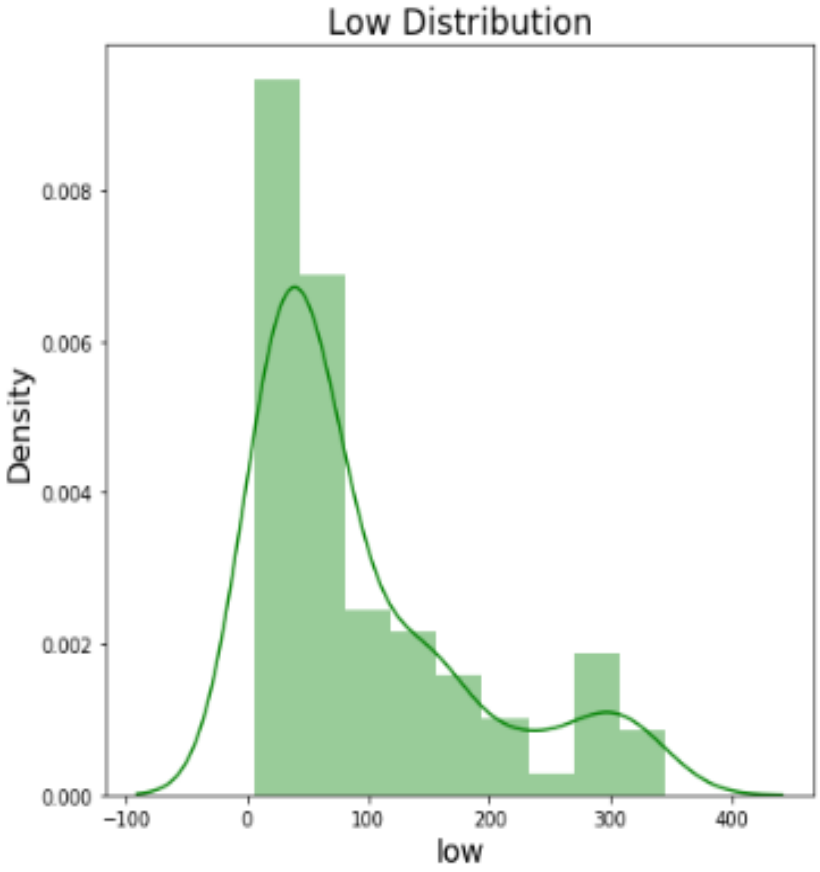
Low Distribution
Density
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0.006
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0.002
0.000
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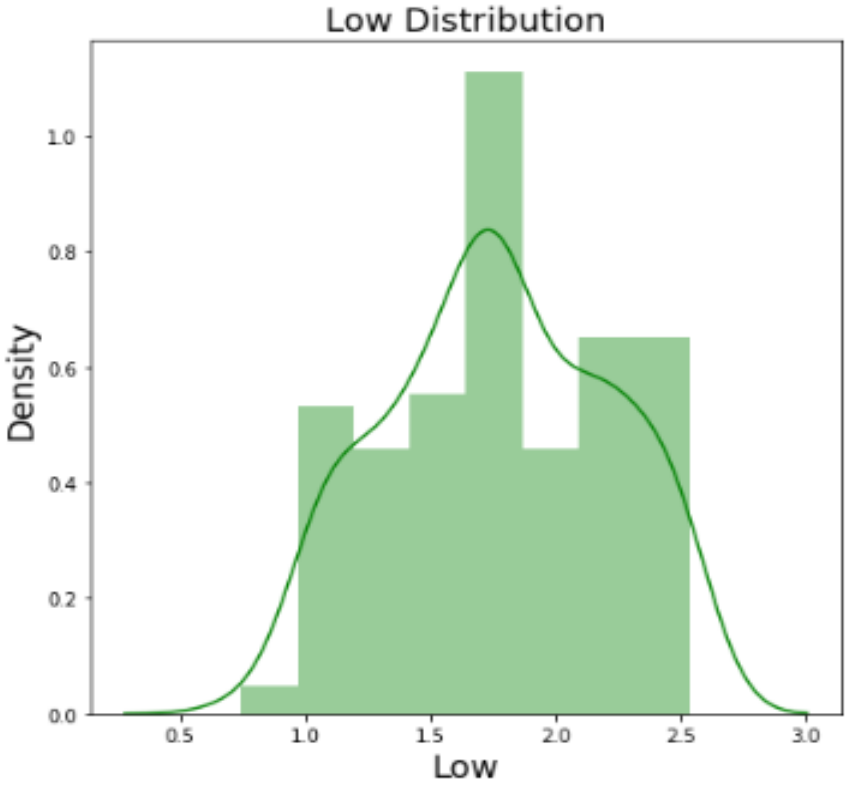
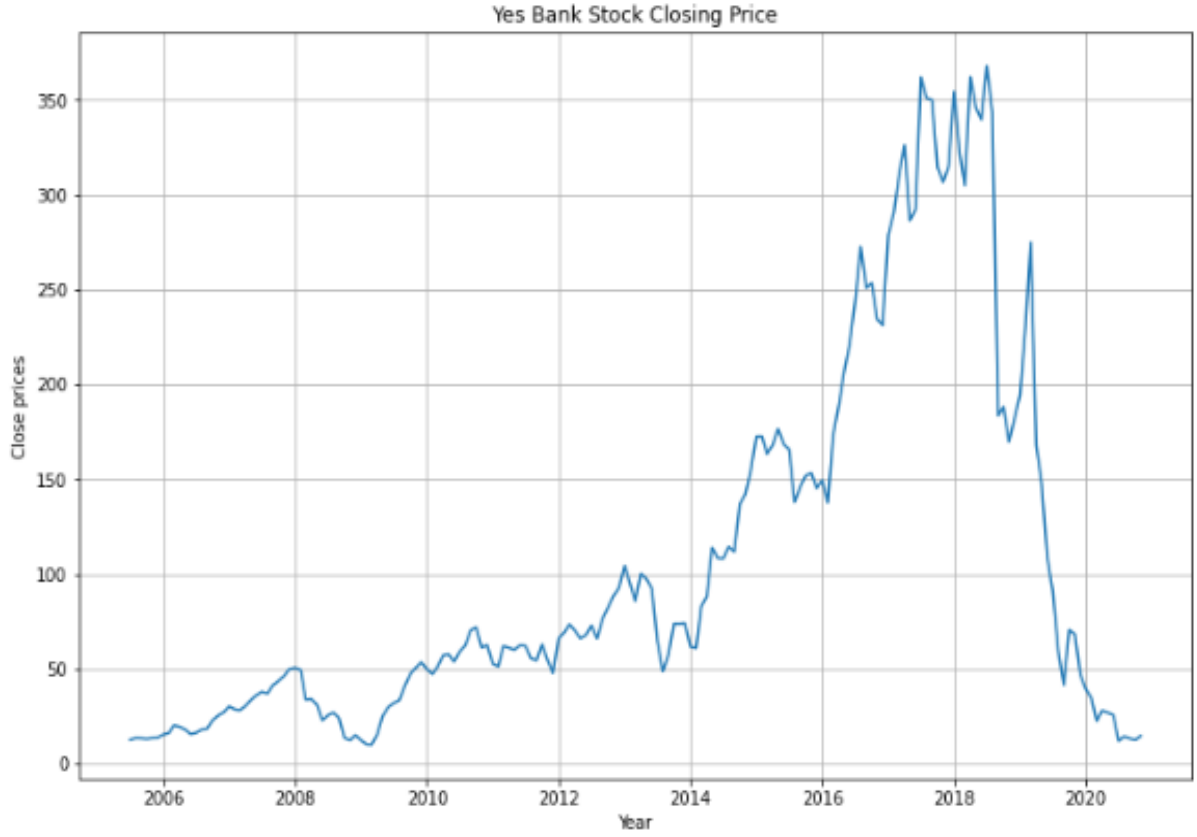
400
low


Low Distribution
Density
1.0
0.8
0.6
0.4
0.2
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Low

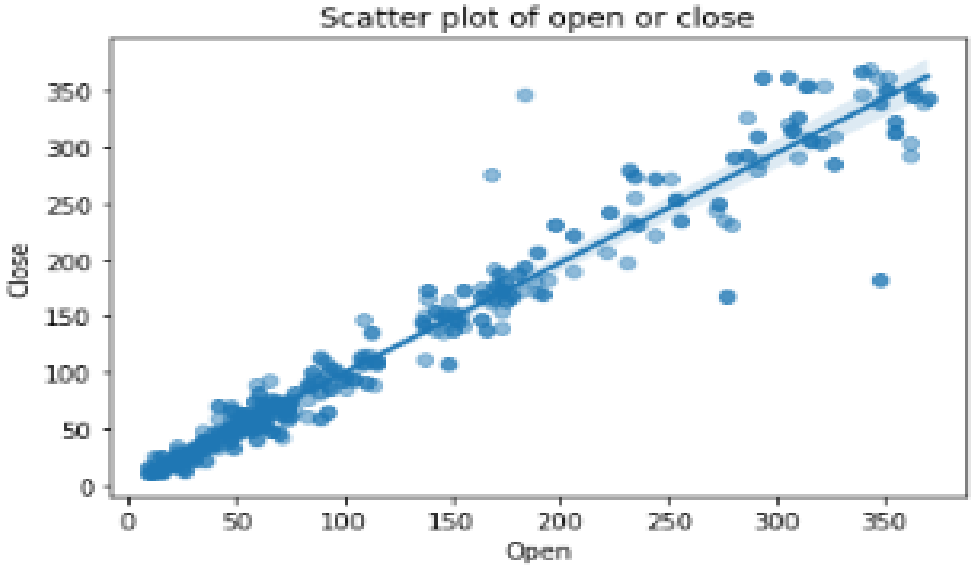
Closing price of stock is always important so I take close price

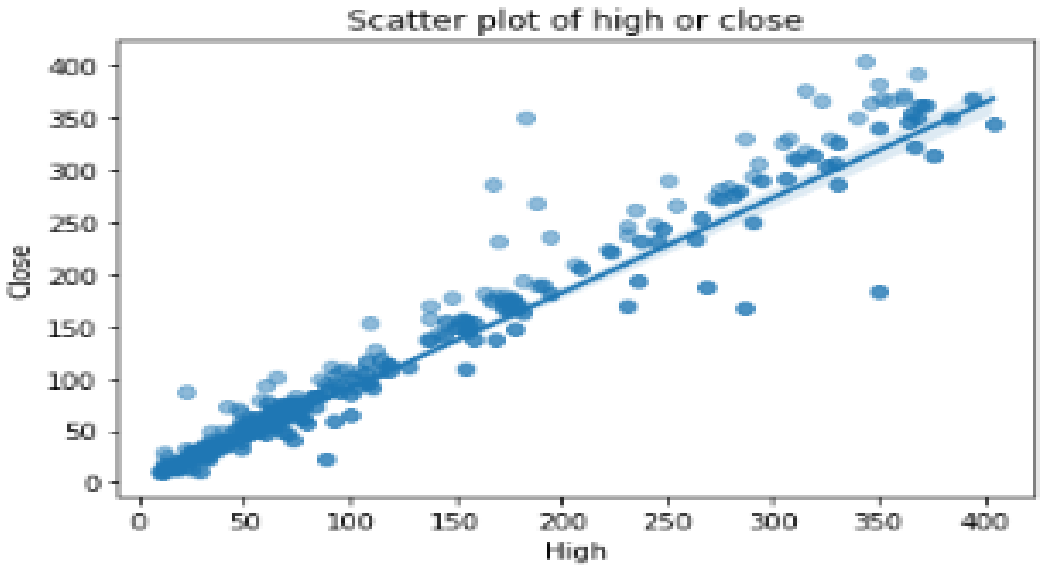
As a dependent variable:

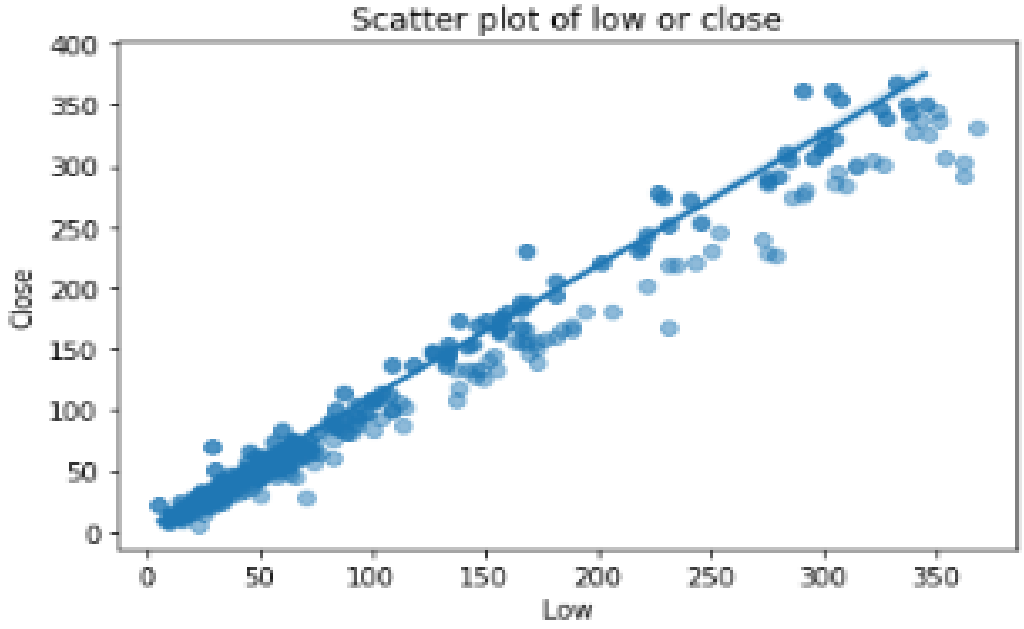


Since 2010 to 2018 the trend is increasing but after 2018 it decreases Because of fraud case.

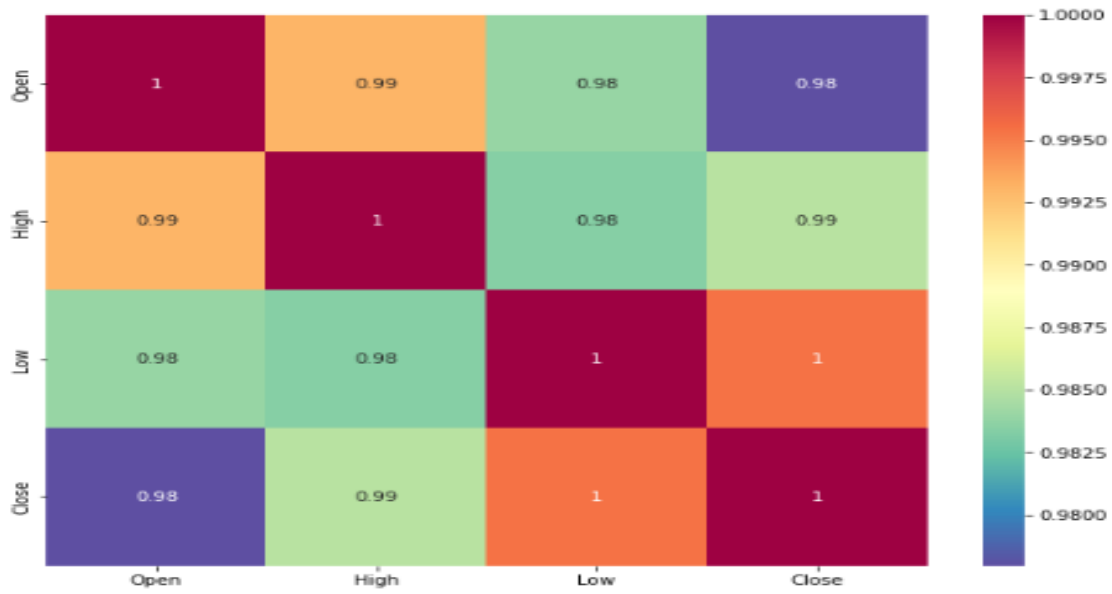
Relation between dependent and independent variable:

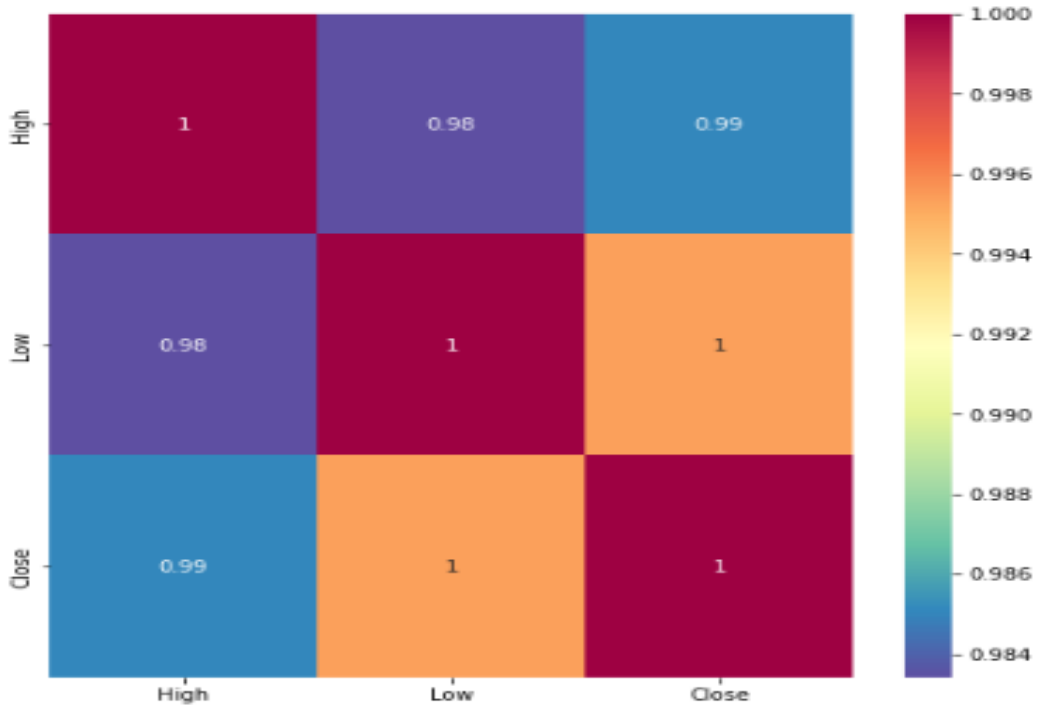






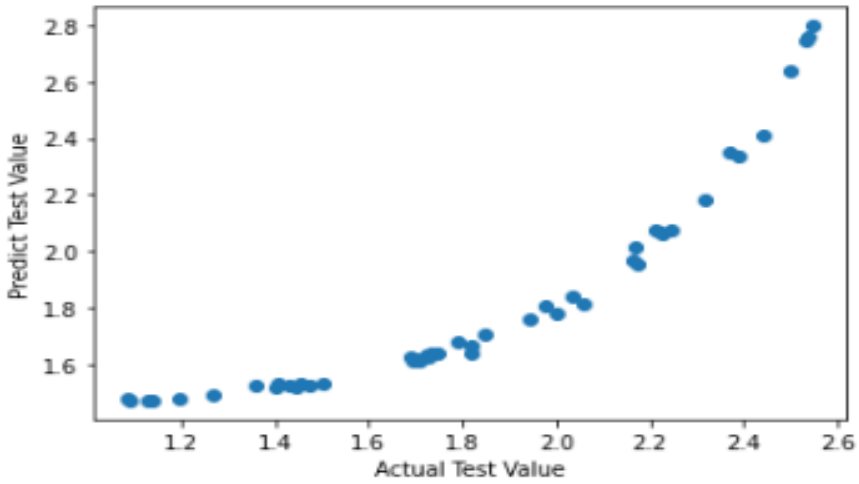
Correlation analysis:

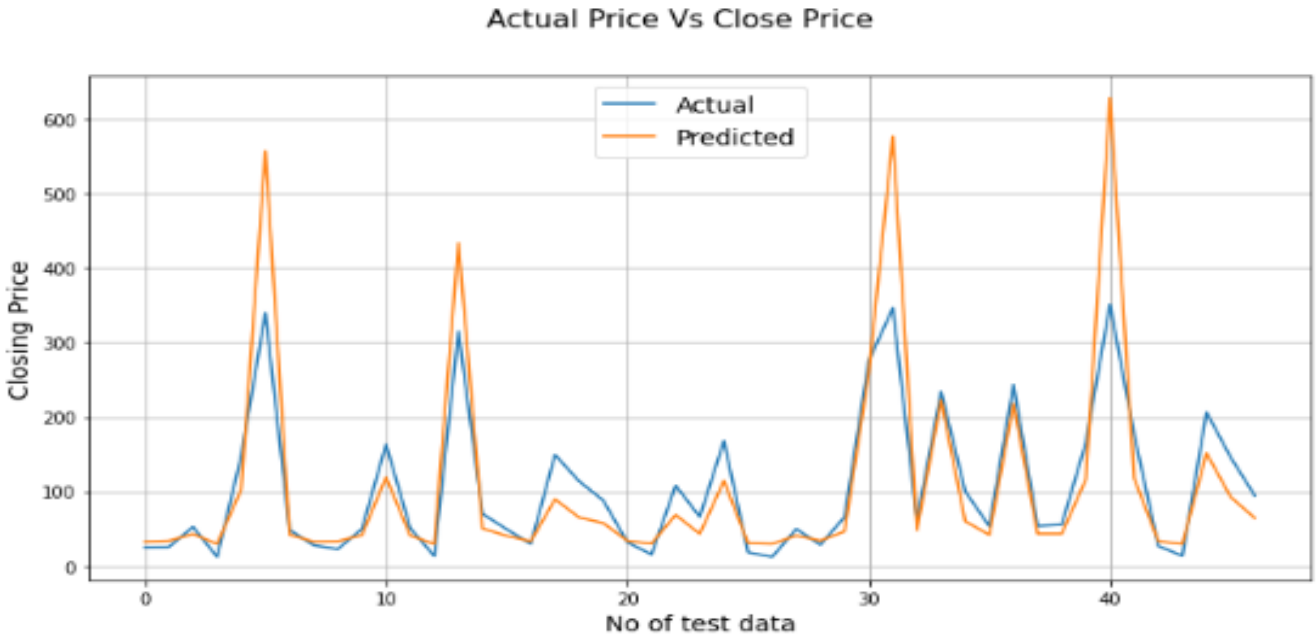




- Linear Regression:

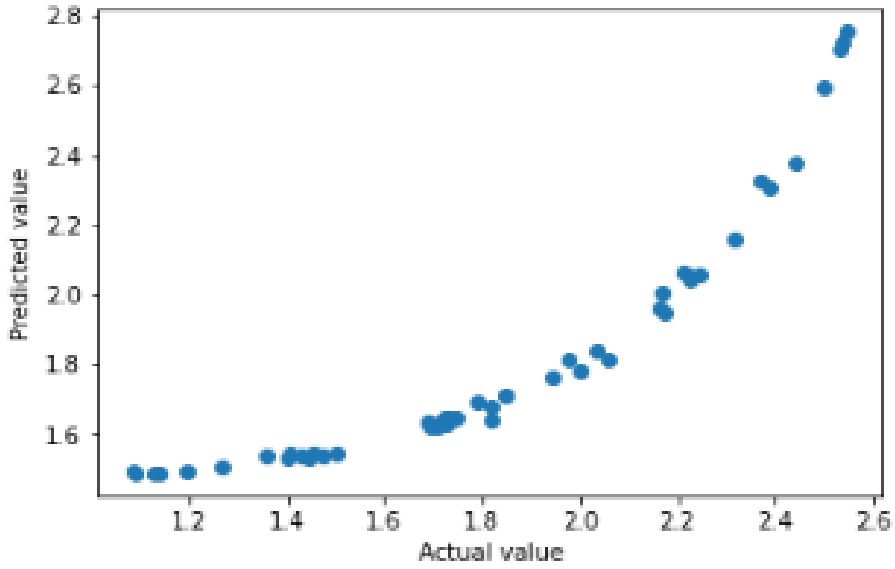
  Linear regression is one of the easiest and most popular Machine learning algorithm. Linear regression is used to Predict the value of variable on the value of another Variable.



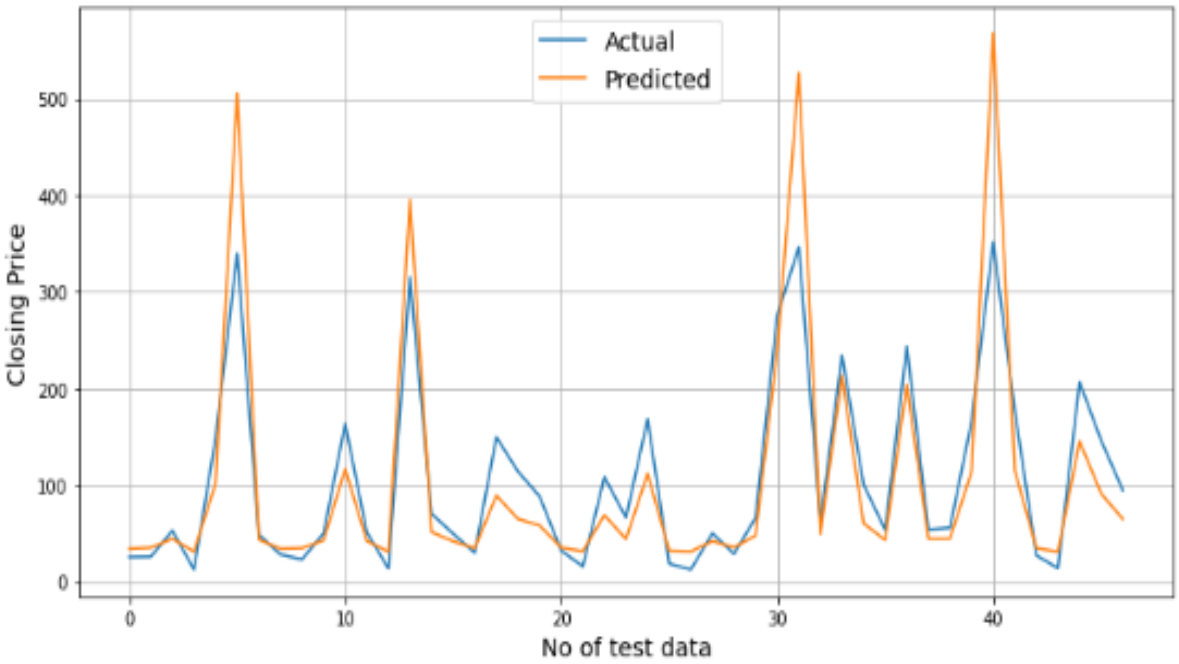


- <u>Lasso regression:</u>

  Lasso means least absolute shrinkage and selection operator. It is a type of linear regression that usage shrinkage. This particular type of regression is well suited for models showing high levels of multicolinearity or when you want to automate certain parts of model selection, like variable selection elimination.

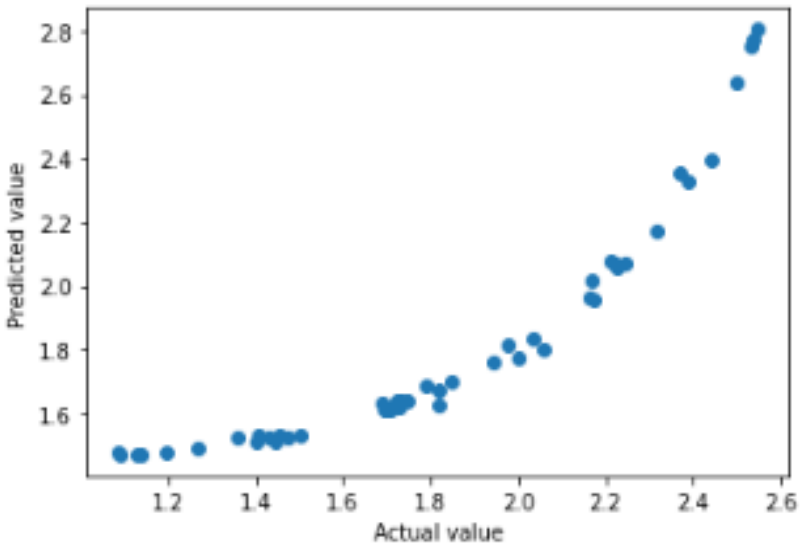


Actual Price Vs Close Price

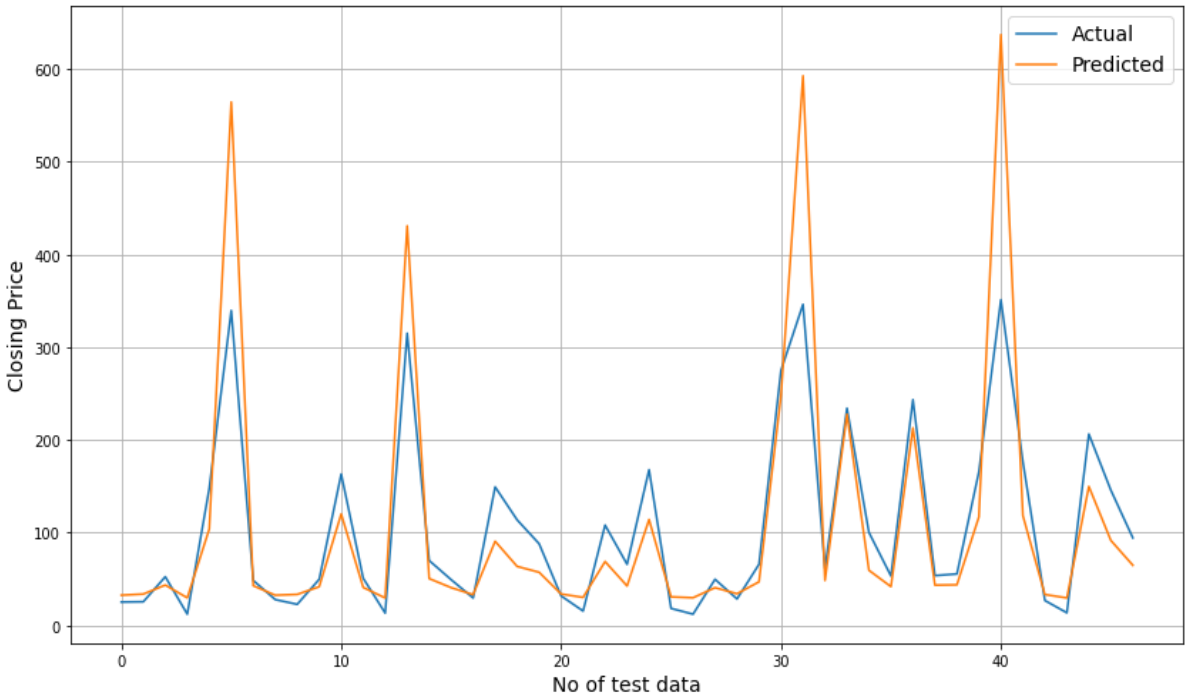


- <u>Ridge regression:</u>

  Ridge regression is a method of estimating coefficients of multiple regression model in scenarios where linearly independent variables are highly correlated. Ridge regression solves the problem of over fitting.

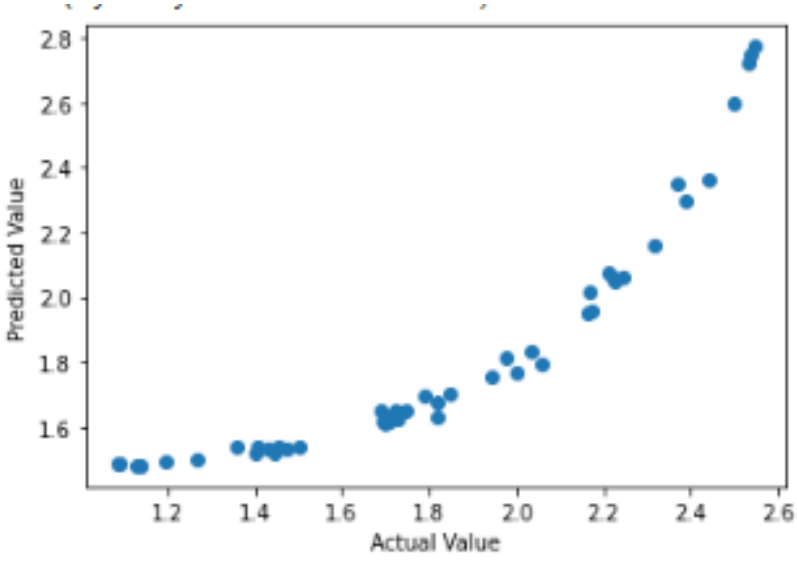


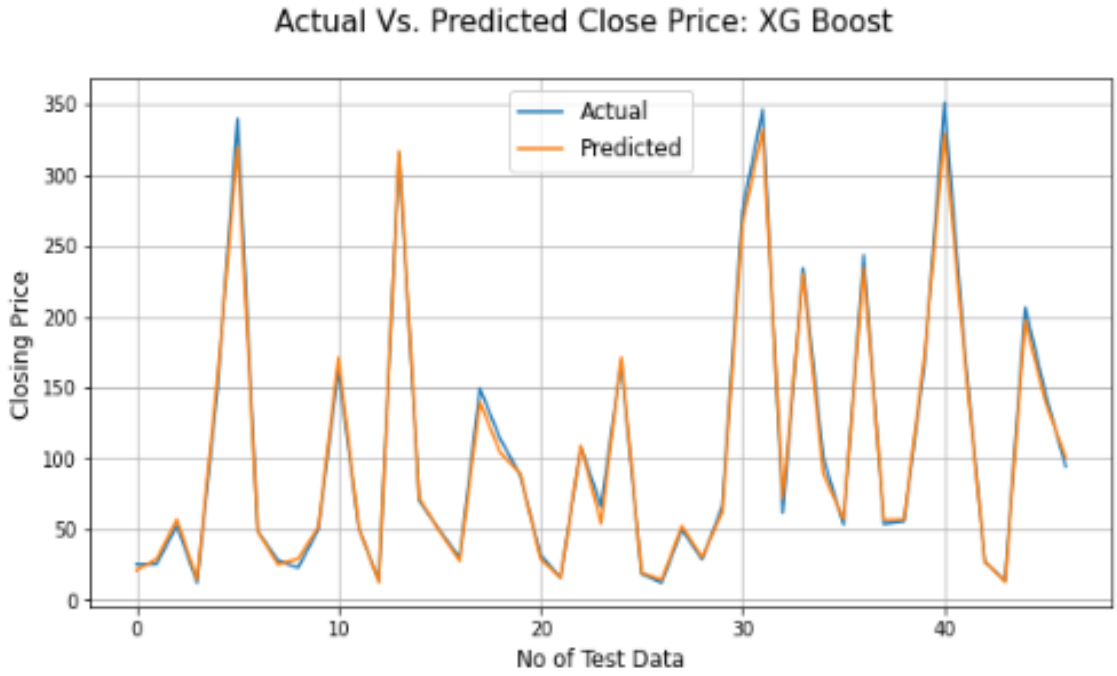
Actual Price Vs Close Price



- <u>XG boost regressor:</u>

  XG boost which stands for extreme gradient boosting, is scalable , distributed gradient boosted decision tree(GBDT) machine learning library. It provide parallel tree boosting to solve many data science in fast and accurate way.





- <u>Cross validation and hyper-parameter:</u>

  Cross validation is the process of training learners one set of data and testing it using different set. Tuning the hyper-parameters of respective algorithms is necessary for getting better accuracy and to avoid overfitting.

<u>Evaluation Metric:</u>

Cross validation and tuning on Linear Regression:

MSE	MSE	MAE	MAPE	R2
0.032	0.18	.0156	0.096	0.821

Cross validation and tuning on Lasso regression:

MSE	MSE	MAE	MAPE	R2
0.033	0.181	0.157	0.096	0.819

Cross validation and tuning on Ridge regression:

MSE	MSE	MAE	MAPE	R2
0.033	0.181	0.157	0.096	0.819

CONCLUSION:

- The technique used for the prediction is useful for researchers to predict future stock closing prices or any fraud happen.
- In this analysis we used linear regression technique, lasso regression, ridge regression and XG boot regression.
- From this above model we found the following results.
- We found high , low, open variables are directly correlated with closing price of stock.
- XG boost regression is best model for yes bank stock closing price prediction.