

Capstone Project-2

Yes Bank Stock Closing Price Prediction

Team

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Introduction

- Yes Bank Limited is an Indian Private Sector Bank headquartered in Mumbai, India, and was founded by Rana Kapoor and Ashok Kapoor in 2004. It offers a wide range of banking and financial products for corporate and retail customers through retail banking and asset management services.
- We used Regression Analysis to predict the future stock price of this company. Starting with linear regression, and then move on to Ridge Regression, Lasso Regression and Elastic Net Regression

Problem statement

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

Data Description

- a. Date: We will use it as an index.
- b. Open: opening price of the stock of a particular day.
- c. High: It's the highest price at which a stock traded during a period.
- d. Low: It's the lowest price at which stock traded during a period.
- e. Close: Closing price of a stock at the end of a trading day.

Analysis Methodology

- Data Cleaning
- Filtering
- Data visualization
- Data Transformation
- Modelling

EDA

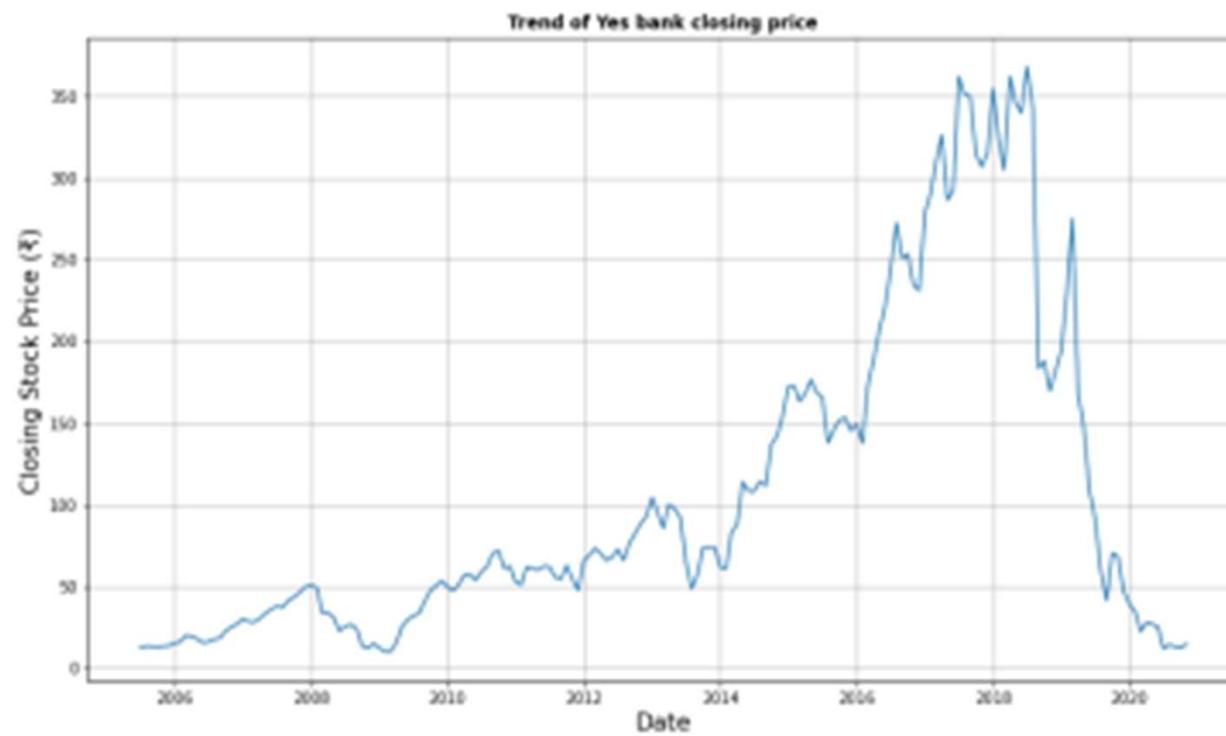


Fig.1: Trend of Yes Bank Closing Price

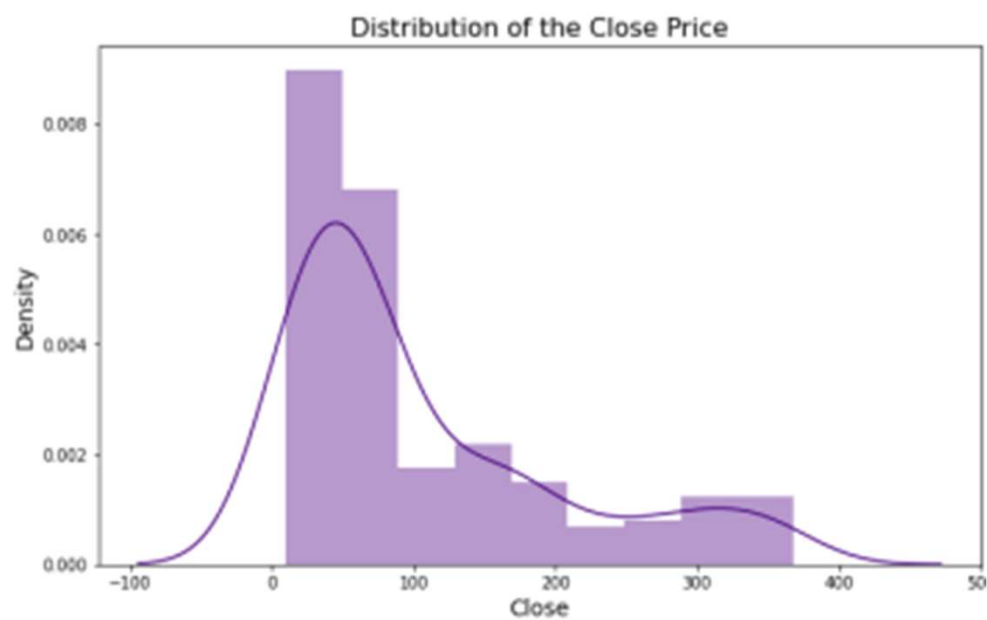


Fig.2: Distribution of Closing Price



Fig.3: Distribution of the Close Price after log transformation

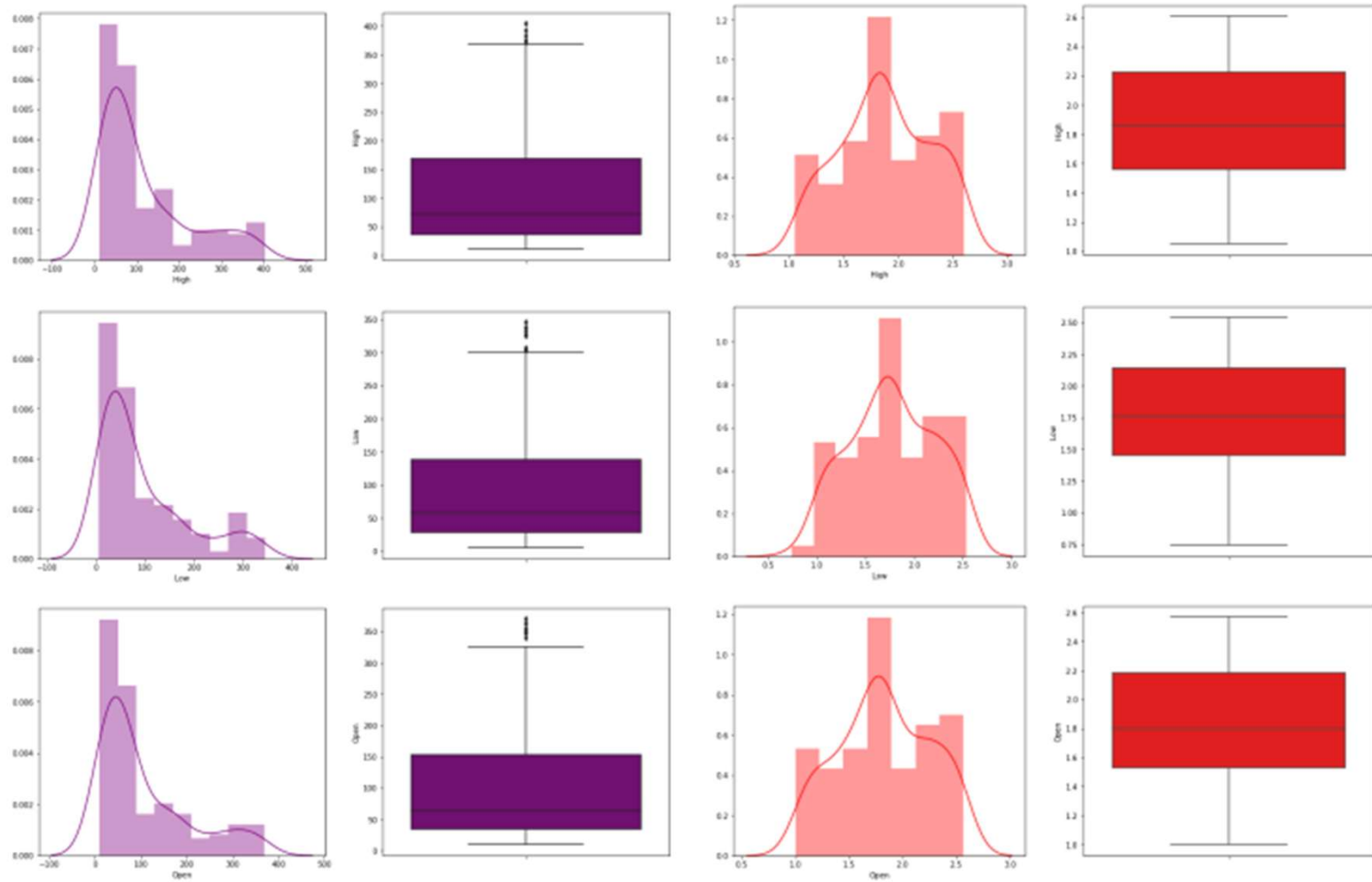


Fig.4: Distribution of High, Low & Open before and after log transformation

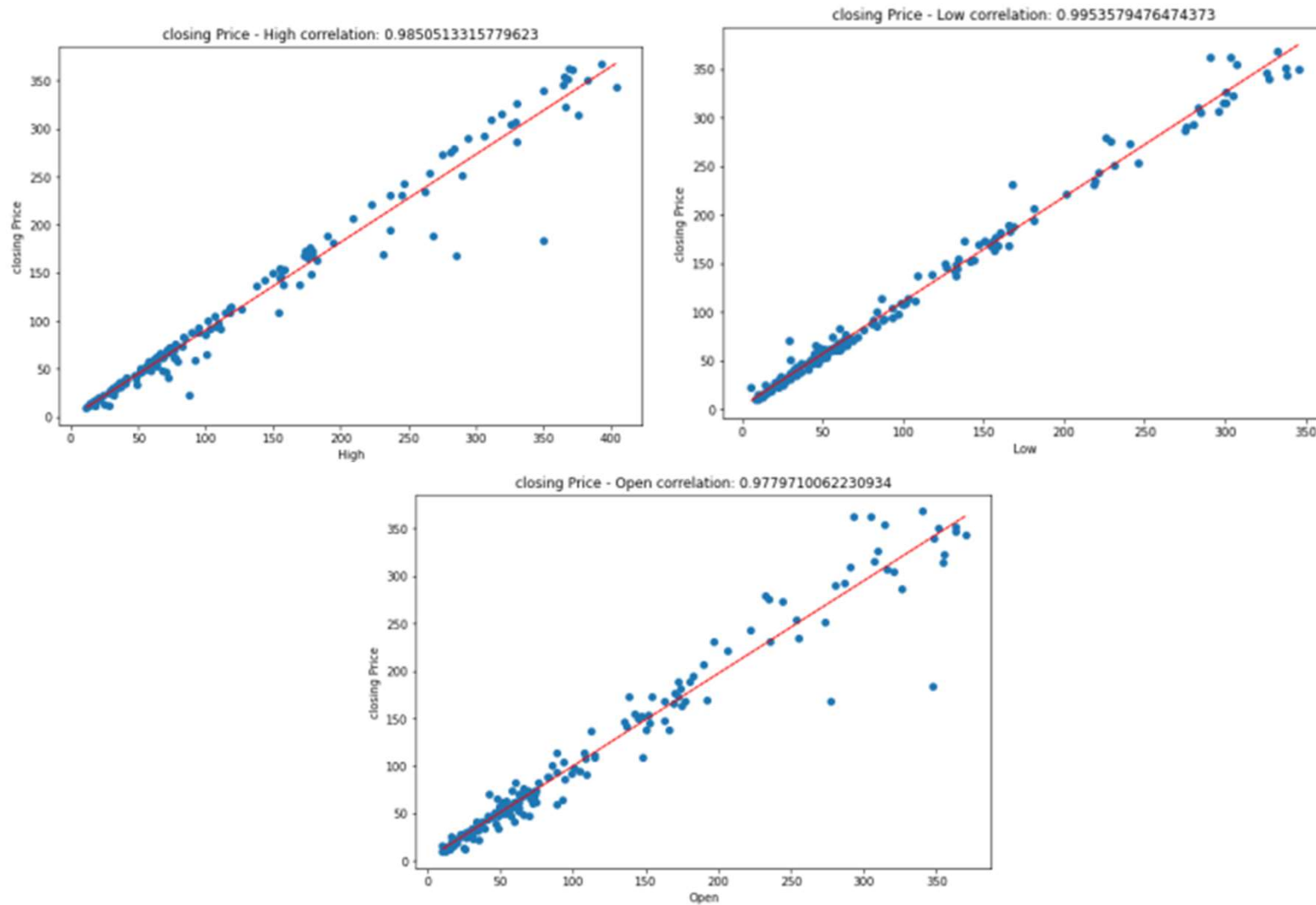


Fig.5: Correlation between Independent variables and Dependent variables

Correlation

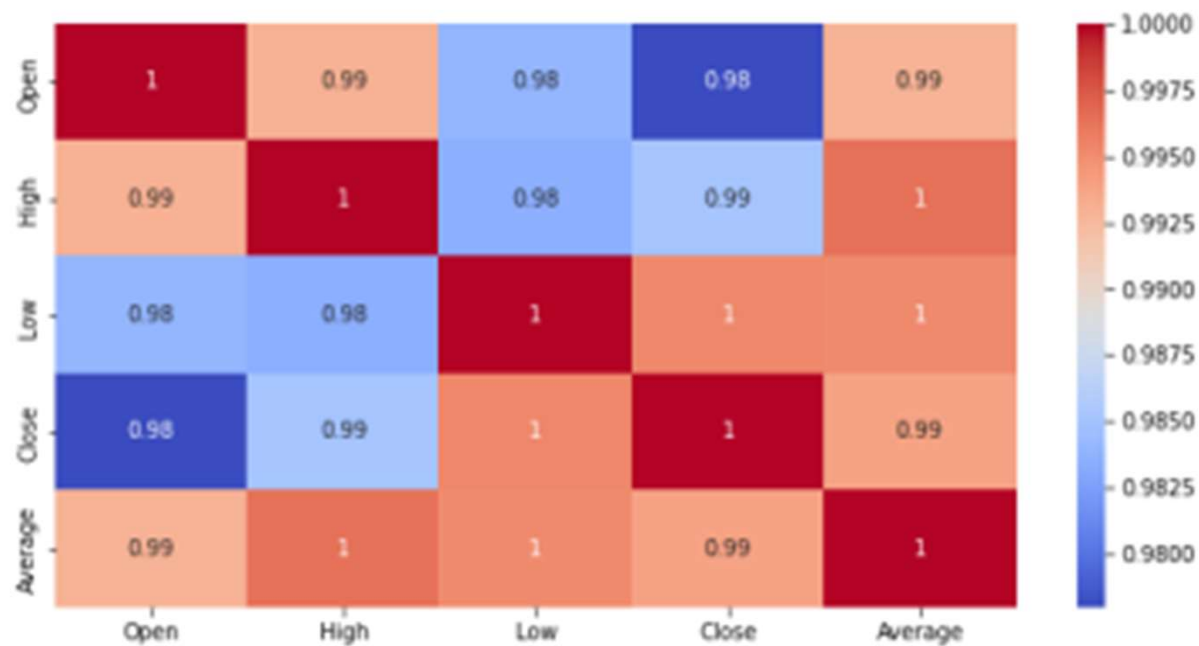


Fig.6: HeatMap for correlation between variables

Model Building

Linear Regression Model

- **Mean Squared Error:** 0.008378716531125619
- **Root Mean Squared Error:** 0.09153532941507131
 - **R2:** 0.9550214108859424
 - **Adjusted R2:** 0.9147774100996803



Fig.7: Actual closing price vs Predicted Price by Linear Regression

Ridge Regression Model

- **Mean Squared Error:** 0.008847513525776934
- **Root Mean Squared Error:** 0.09406122222136461
- **R2:** 0.9525048169276678



Fig 8. Actual closing price vs Predicted Price by Ridge Regression

Lasso Regression Model

- **Mean Squared Error:** 0.009376701436556797
- **Root Mean Squared Error:** 0.09683336943717696
 - **R2:** 0.9496640327198869
 - **Adjusted R2:** 0.9046265883113646



Fig 9. Actual closing price vs predicted price by Lasso Regression

Elastic Net Regression

- **Mean Squared Error:** 0.009096377849834535
- **Root Mean Squared Error:** 0.09537493302663198
 - **R²:** 0.9511688645612937
 - **Adjusted R²:** 0.9074778486424512

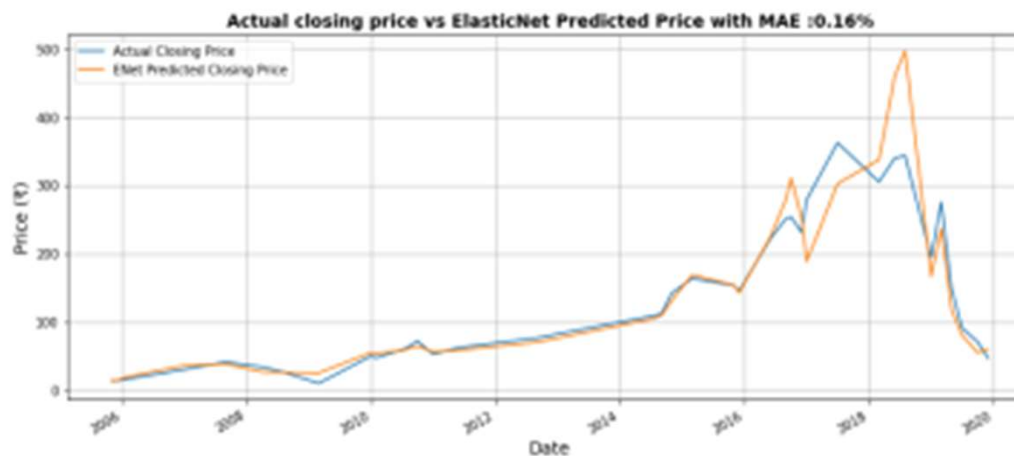


Fig 10. Actual closing price vs predicted price by
ElasticNet Regression

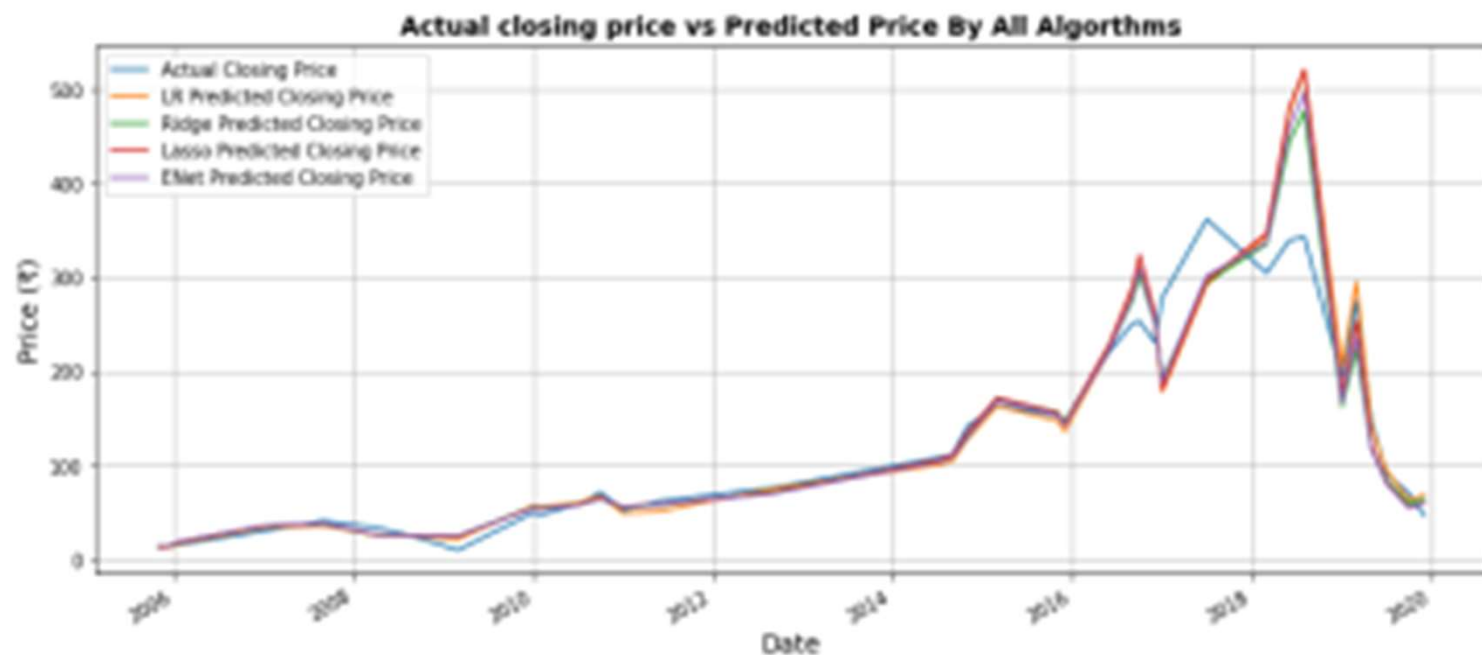


Fig 11. Actual closing price vs predicted by all algorithms

Conclusion

- Target Variable is strongly dependent on Independent Variables.
- Linear Regression and Lasso are performing better than other models with training accuracy 94.0359% and 94.45777% respectively.
- Apart from Linear Regression and Lasso, Ridge and Elastic Net are also performing better but they have less training accuracy.
- Ridge and ElasticNet are performing far much better after Applying Hyperparameter Tuning and Cross validation, it is because we have a small set of datasets.
- R2 and Adjusted R2 are around 95 and 91% in each model.