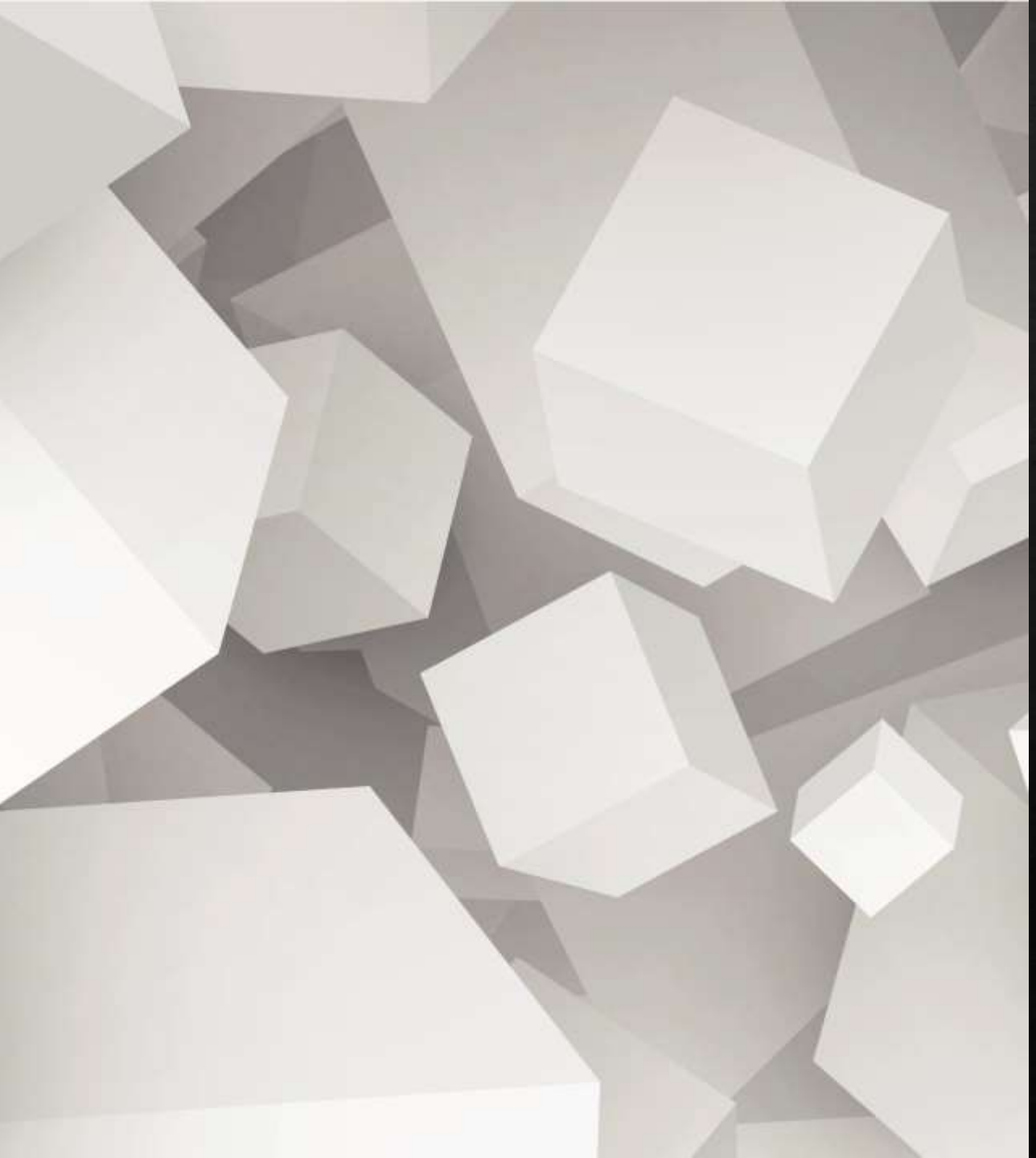
YES BANK STOCK CLOSING PRICE PREDICTION

Namira Mujawar(Final year Student)

(Dr. Babasaheb Ambedkar technological University Lonere)



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Introduction

- YES BANK STOCK CLOSING PRICE PREDICTION involves forecasting the final trading price of YES BANK's stock on a given trading day.
- Methods used include technical analysis, fundamental analysis, machine learning, and financial models.
- Historical data, market trends, and statistical models are used to make educated guesses about future prices.
- Stock price prediction carries uncertainties due to market sentiment, economic conditions, company performance, and unforeseen events.
- Caution and skepticism are advised when using stock predictions for investment decisions.
- Thorough research and advice from financial professionals are essential before making investment choices.
- No method can guarantee perfect accuracy in stock price predictions.
- Regulatory compliance and diversified portfolios are crucial for informed financial decisions based on stock predictions.

Problem Statement

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 was interesting to see how that impacted the stock prices of the company and whether Time series models or any other predictive models can do justice to such situations. 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 for the month.

Dataset Information

We have 185 rows and 4 columns in our dataset with no null values. Here our dependent variable will be Close, and independent variables are - Open, High and Low.

- **Date:** It denotes the month and year of the for a particular price.
- **Open:** Open means the price at which a stock started trading that month.
- **High:** refers to the maximum price that month.
- **Low:** refers to the minimum price that month.
- **Close:** refers to the final trading price for that month, which we have to predict using regression

Why do we need this project?

1. Customer Targeting: The project helps banks identify potential customers who are more likely to respond positively to marketing campaigns. This targeting improves the efficiency of marketing efforts and reduces wastage of resources.

2. Improved Marketing ROI: By accurately predicting customer response, banks can allocate their marketing budget more effectively, leading to a higher return on investment (ROI) for marketing activities.

3. Enhanced Customer Experience: By understanding customer preferences and needs, banks can offer personalized products and services, leading to improved customer satisfaction and loyalty.

4. Competitive Advantage: Banks that can effectively predict marketing effectiveness gain a competitive edge in the market by staying ahead in customer acquisition and retention strategies.

5. Optimal Resource Allocation: With predictive insights, banks can allocate resources wisely, directing efforts towards areas with the highest likelihood of success, leading to cost optimization.

6. Better Decision-Making: Data-driven decisions based on predictive analysis provide more reliable insights, helping banks make informed and strategic choices in their marketing strategies.

7. Risk Mitigation: Accurate predictions allow banks to identify potential risks associated with marketing campaigns, reducing the possibility of costly mistakes and negative impacts on the brand's reputation.

8. Business Growth: The project contributes to business growth by driving customer acquisition, increasing cross-selling opportunities, and expanding the customer base.

9. Customer Retention: Understanding customer behavior through predictive analysis enables banks to design retention strategies to keep existing customers engaged and loyal.

10. Adaptation to Market Changes: Continuous analysis of customer behavior enables banks to adapt their marketing strategies in real-time, ensuring relevance and responsiveness to market changes.

Overall, the project is crucial for banks to optimize their marketing efforts, improve customer acquisition and retention, and gain a competitive advantage in the dynamic and competitive financial industry.

What is Regression

- Regression is a statistical technique used to model the relationship between a dependent variable and one or more independent variables.
- It is primarily used for prediction and estimating numerical values of the dependent variable based on the values of the independent variables.
- The relationship between variables is assumed to be linear in simple linear regression, but it can be extended to capture more complex relationships in multiple regression and polynomial regression.
- The main goal is to minimize the difference between actual and predicted values, usually measured by metrics like Mean Squared Error (MSE) or Root Mean Squared Error (RMSE).
- Regression is widely applied in various fields, including economics, finance, social sciences, and machine learning, for making data-driven decisions and predictions.
- It is essential to assess the assumptions of regression, such as linearity, independence of errors, and constant variance, to ensure the model's validity.

- Overfitting and underfitting are common challenges in regression, requiring careful model tuning to strike the right balance between complexity and generalization.
- Outliers can significantly influence regression results, necessitating outlier detection and handling techniques.
- Different types of regression exist, including linear regression, multiple regression, logistic regression (for binary classification), and non-linear regression models, tailored to various data and problem types.
- Regression is a powerful and fundamental tool in statistical analysis and machine learning, providing valuable insights into relationships between variables and enabling accurate predictions.

Problem-Solving Approaches

- LINEAR REGRESSION
- LASSO REGRESSION
- RIDGE REGRESSION
- KNN
- XGBOOST REGRESSOR

Outputs

	Model_Name	MAE	MSE	RMSE	MAPE
0	Linear regression	3.05	19.99	4.47	5.40
2	Ridge regression	3.06	20.10	4.48	5.42
1	Lasso regression	3.13	20.88	4.57	5.53
4	XGBoost regressor	3.88	30.99	5.57	6.68
3	KNN regressor	4.10	37.73	6.14	6.44

How the project is useful for stakeholders?

- **Stock Price Prediction**:
- **Risk Management**
- **Impact Analysis**
- **Model Selection**
- **Performance Evaluation**
- **Investment Strategy**
- **Financial Planning**

Conclusion

- The target variable highly depends on input variables, indicating a strong relationship.
- Linear Regression achieved the best results with the lowest MAE, MSE, RMSE, and MAPE scores, suggesting accurate predictions with low errors.
- Ridge Regression reduced complexity and addressed multicollinearity, impacting evaluation metrics.
- Lasso Regression performed feature selection but was inferior to Ridge Regression, indicating all features' importance for accurate predictions.
- All models achieved over 90% accuracy, but other error metrics and data balance should be considered for comprehensive evaluation.
- KNN and XGBoost showed similar predictive capabilities, requiring consideration of interpretability, efficiency, and implementation ease for model selection.

THANK YOU