

# TCS Stock Data Analysis and Prediction

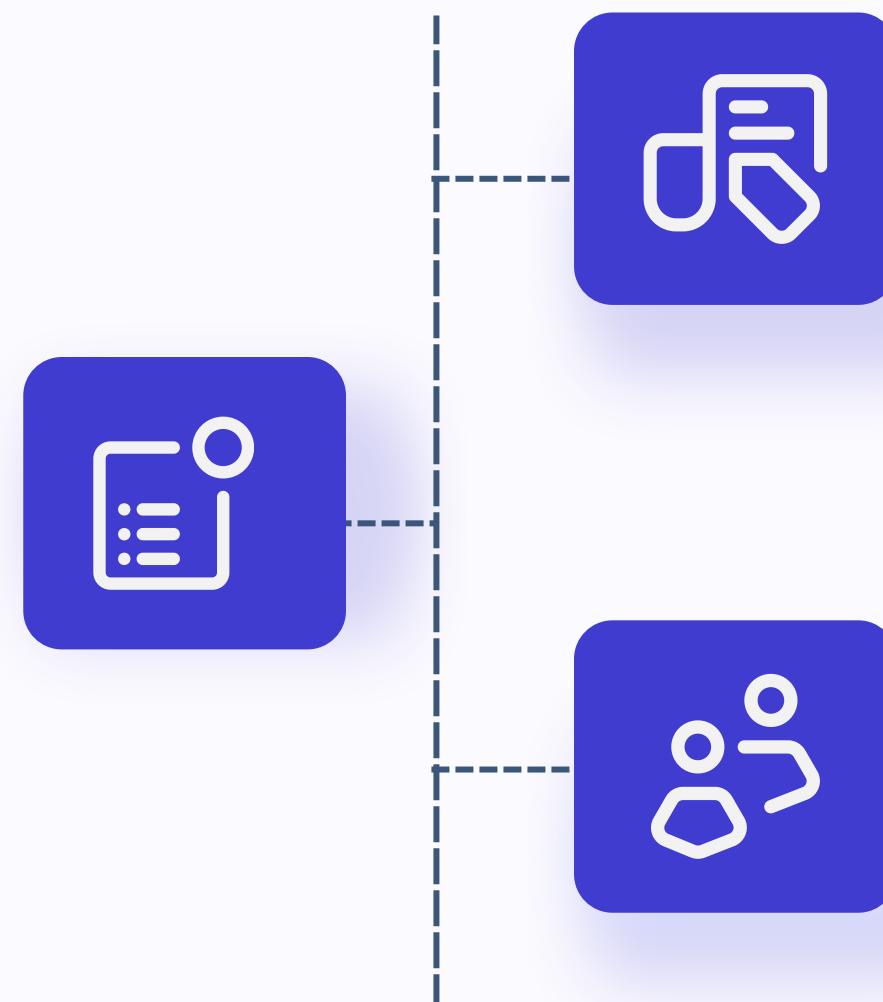
This presentation will explore the use of machine learning techniques to analyze and predict TCS stock performance.

 by Dhruv Singh



# Introduction to the Project

We will examine TCS stock data to understand historical trends and patterns.



Our goal is to forecast future stock prices and identify potential opportunities.

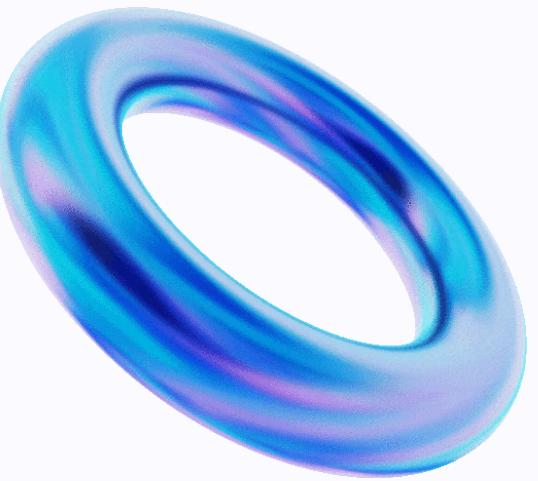
We'll utilize Machine Learning models to predict the stock price movement.



# Technologies & Tools

- 1 Python is the main programming language used for this project.
- 2 We leverage various Python libraries including Pandas, NumPy, Matplotlib, Seaborn, and Scikit-learn.
- 3 Data analysis is performed using SQL and Excel.
- 4 The Linear Regression model is used for predicting stock price trends.

# Dataset Overview



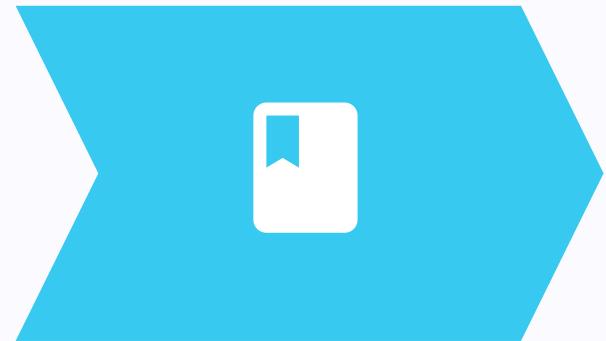
The dataset contains historical TCS stock data sourced from reputable financial websites.



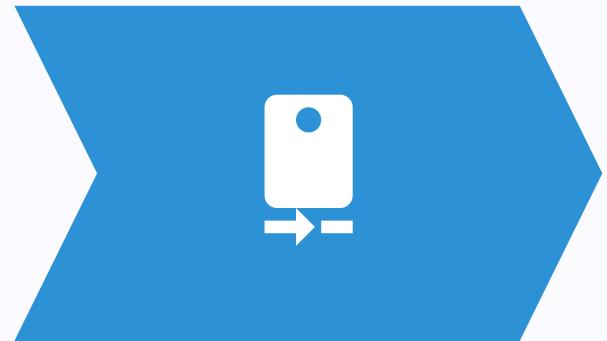
## Key columns :-

- Date – Trading date
- Open – Opening stock price
- High – Highest stock price of the day
- Low – Lowest stock price of the day
- Close – Closing stock price
- Volume – Number of shares traded
- Dividends – Dividends paid on the stock
- Stock Splits – Number of stock splits

# Data Cleaning & Preprocessing



Missing values are handled using a forward-fill method to ensure data consistency.



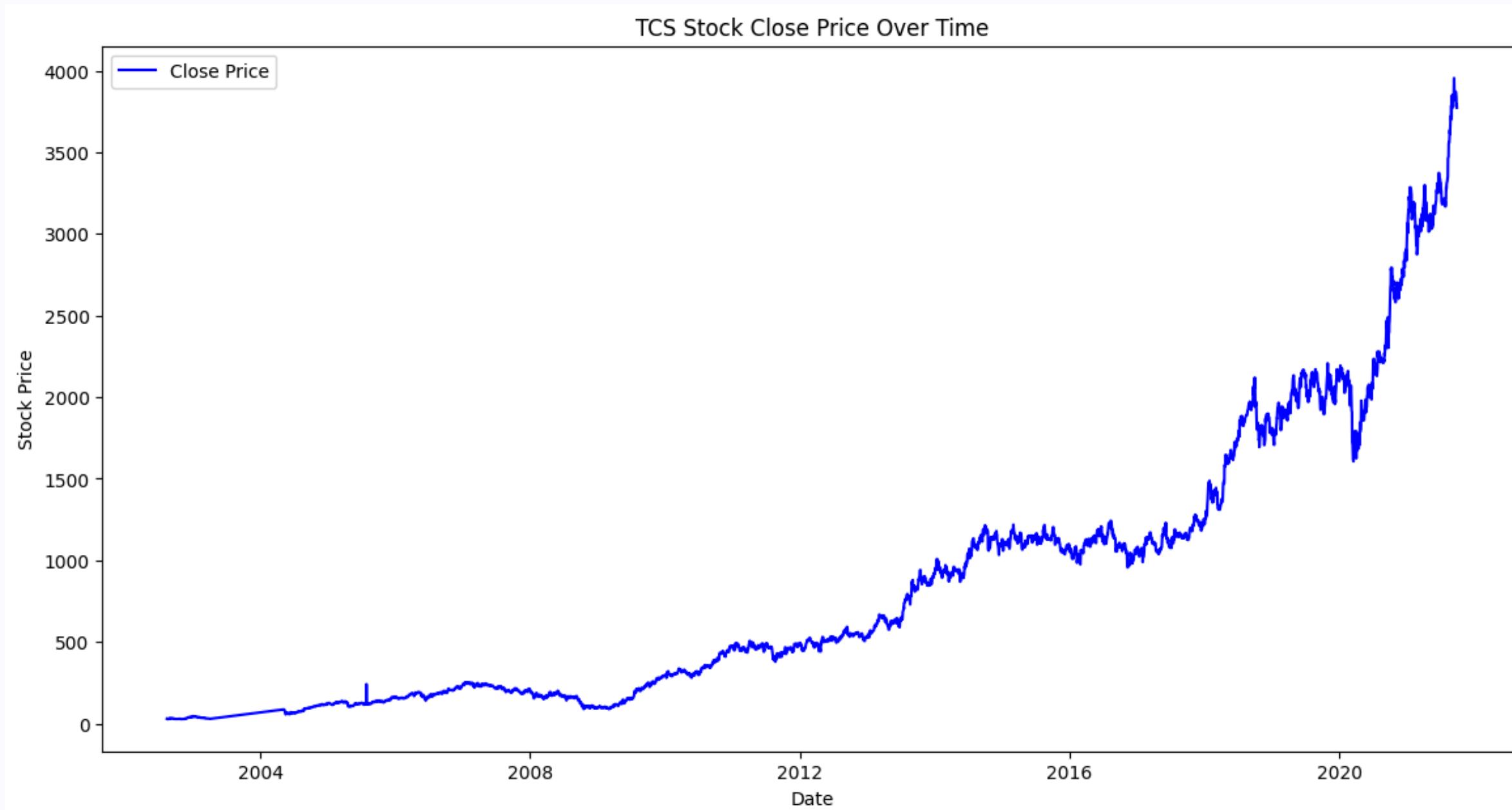
Numerical columns are standardized to remove anomalies and prepare data for analysis.



We perform feature engineering by adding moving averages and lag variables for trend analysis.

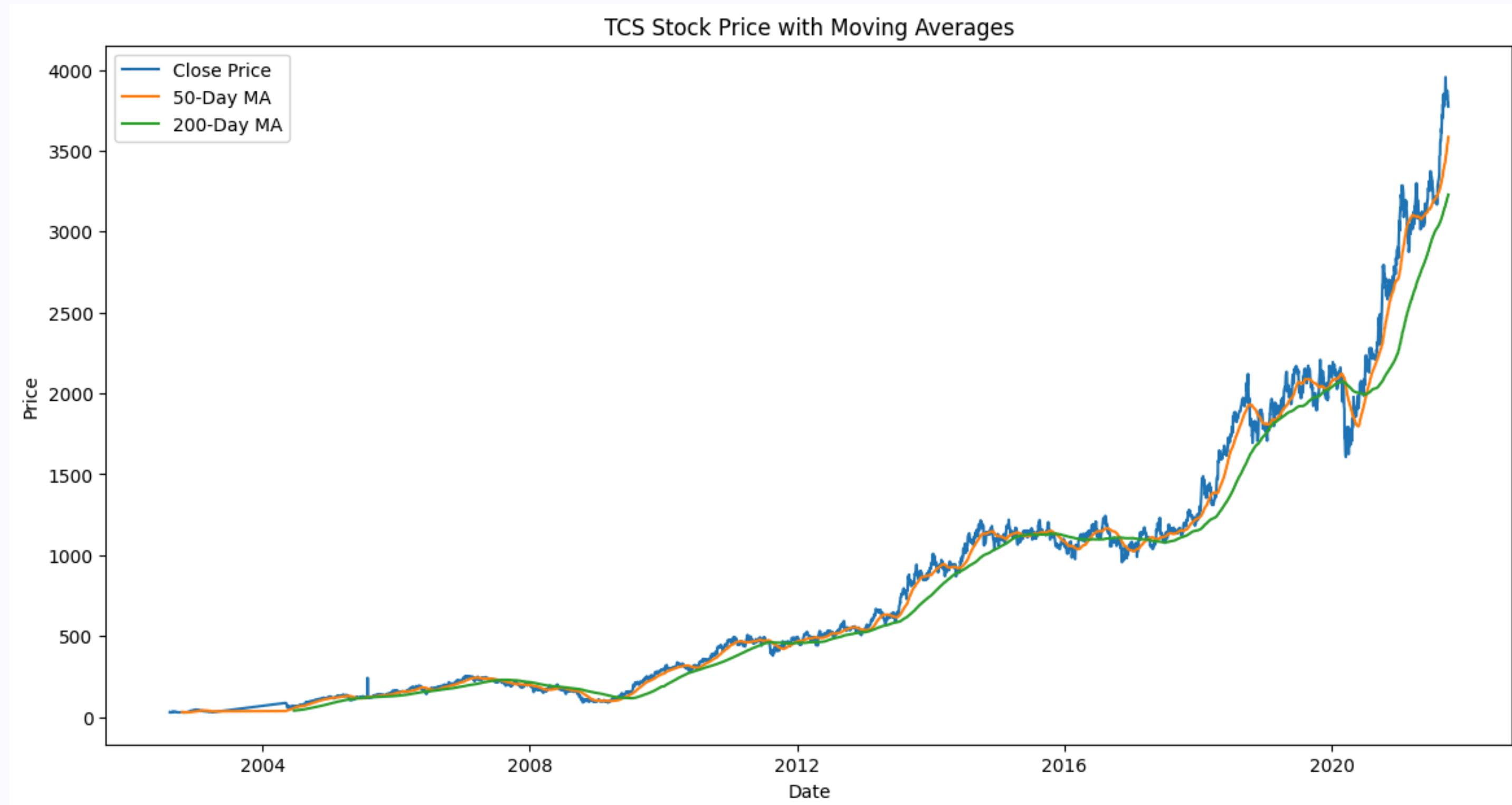
# Stock Close Price Over Time

- We analyzed historical TCS stock price data to identify trends and patterns.
- The analysis revealed price spikes and other noteworthy patterns.



# Stock Price with Moving Averages

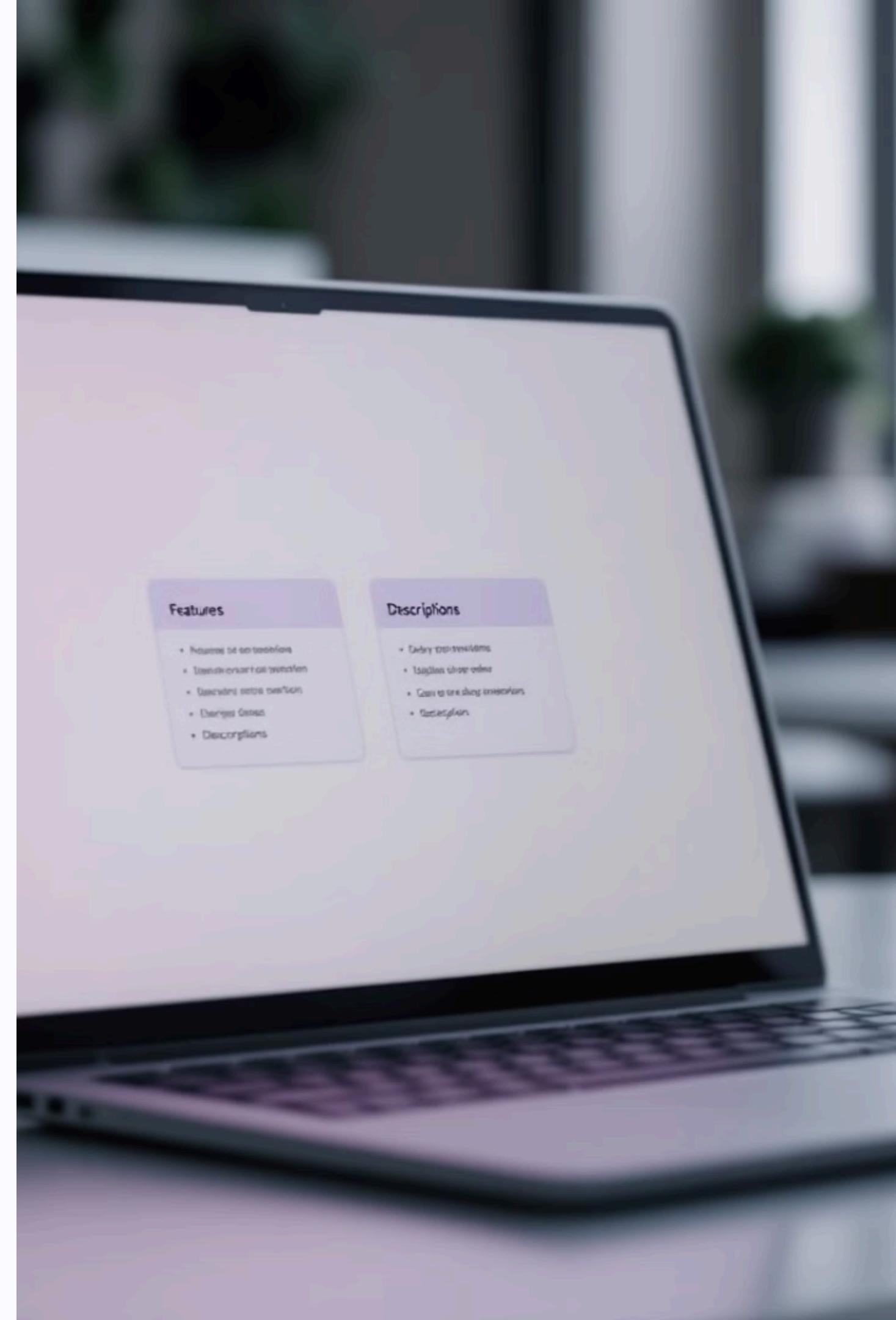
**Key Insight:**  
Moving average crossovers indicate bullish/bearish trends.



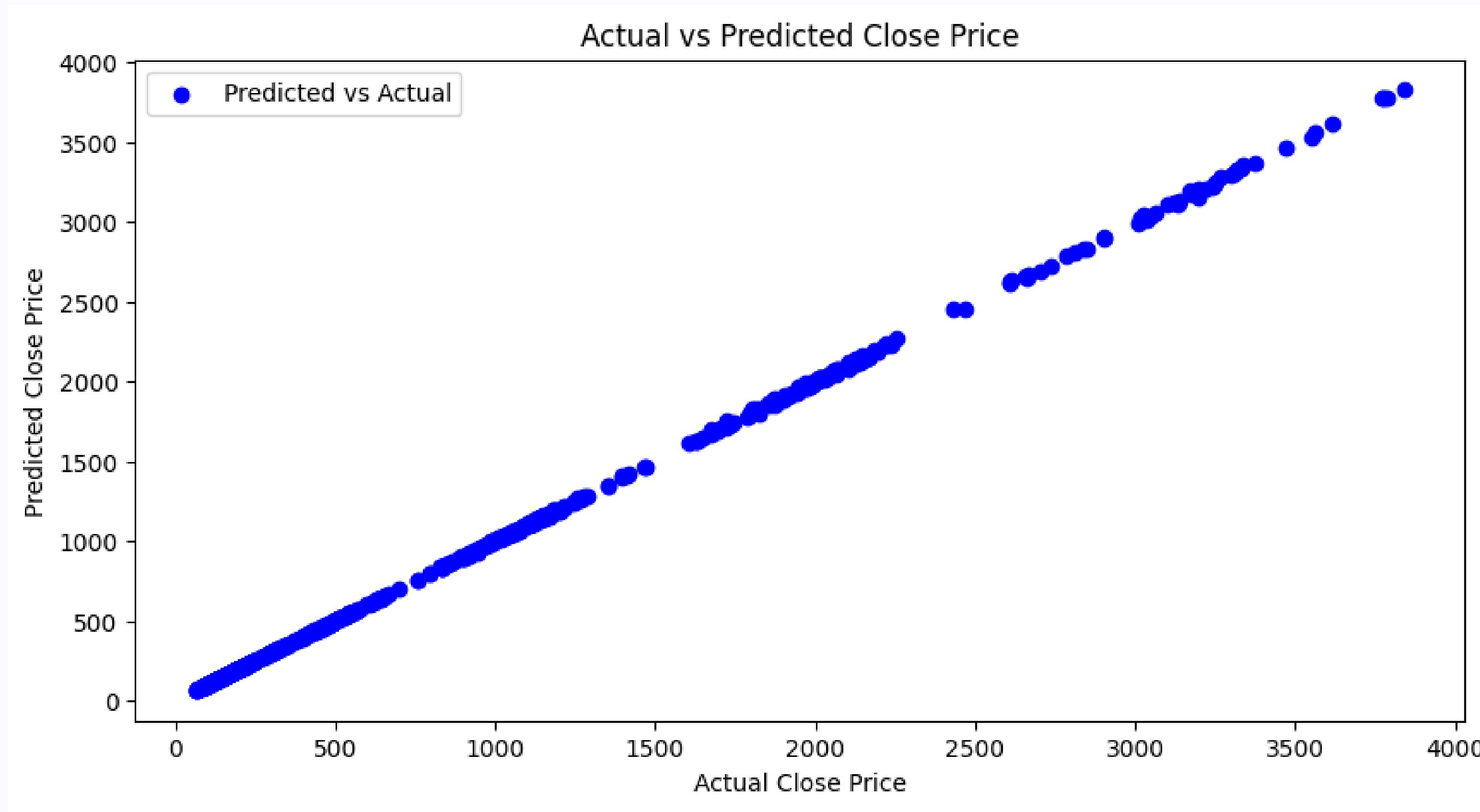
# Creating New Features for Analysis

New features were extracted from the dataset, such as year, month, day, and day of the week.

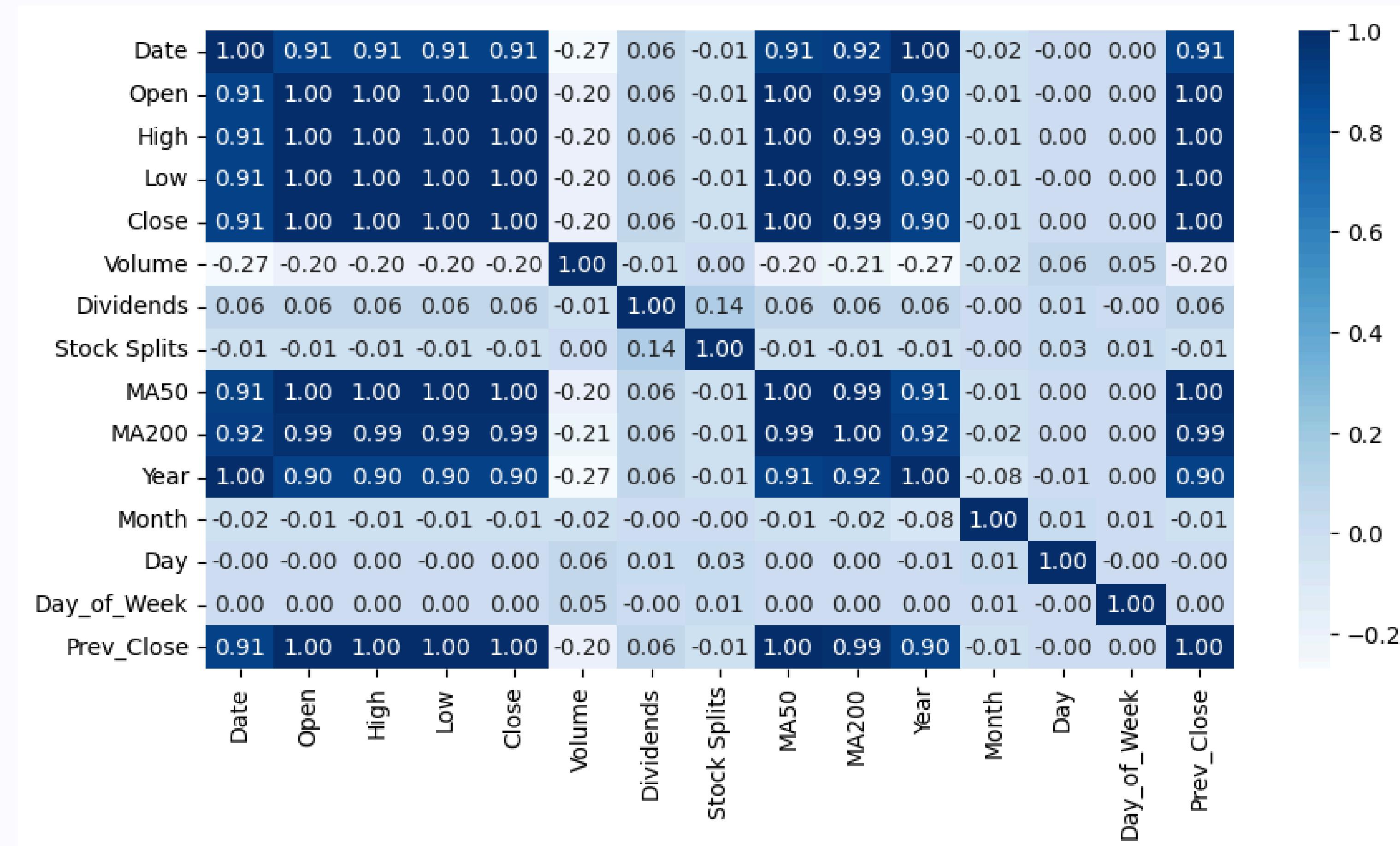
Lag variables were created to analyze the relationship between current and previous stock prices.



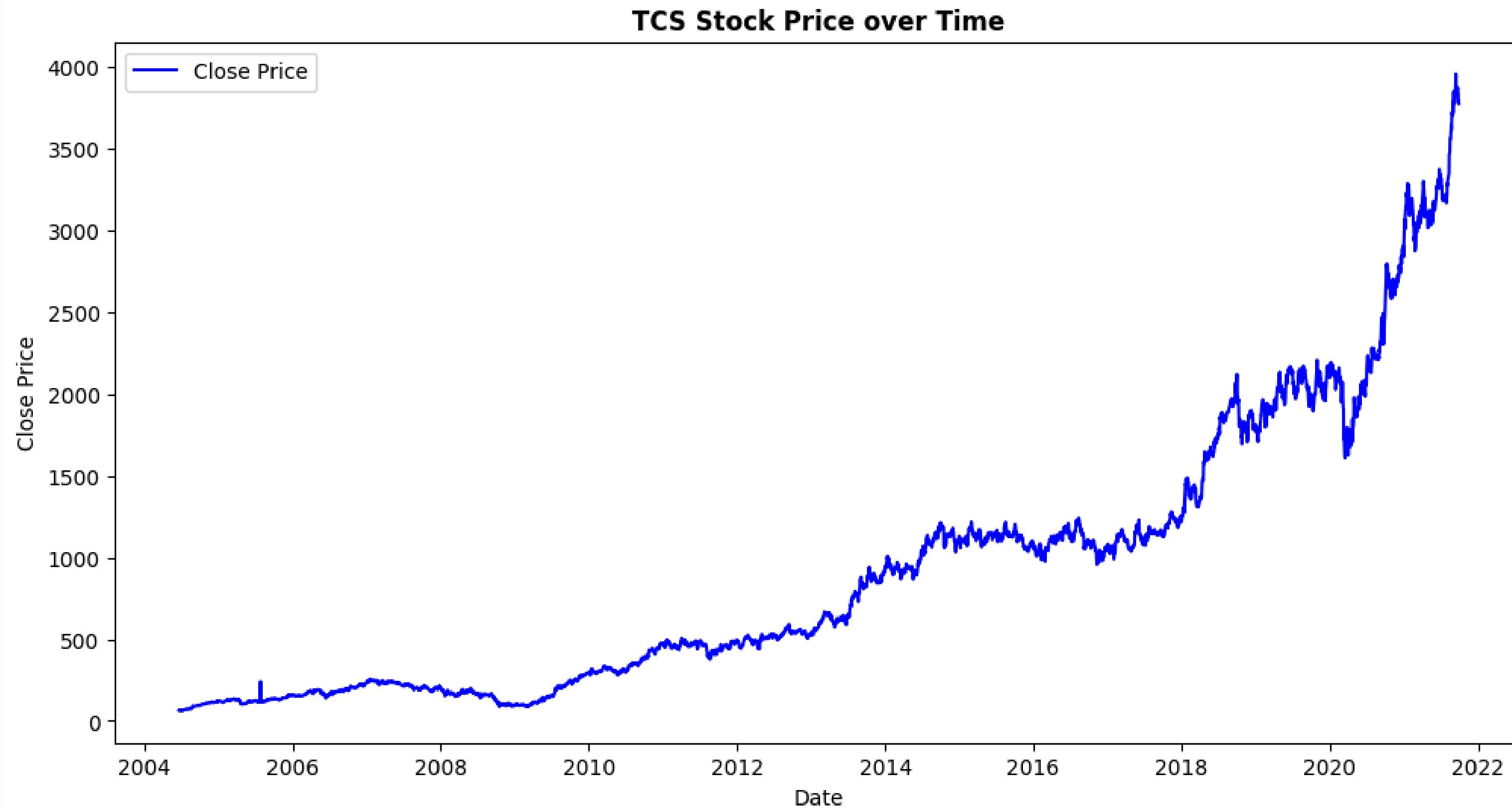
# Actual vs Predicted Close Price



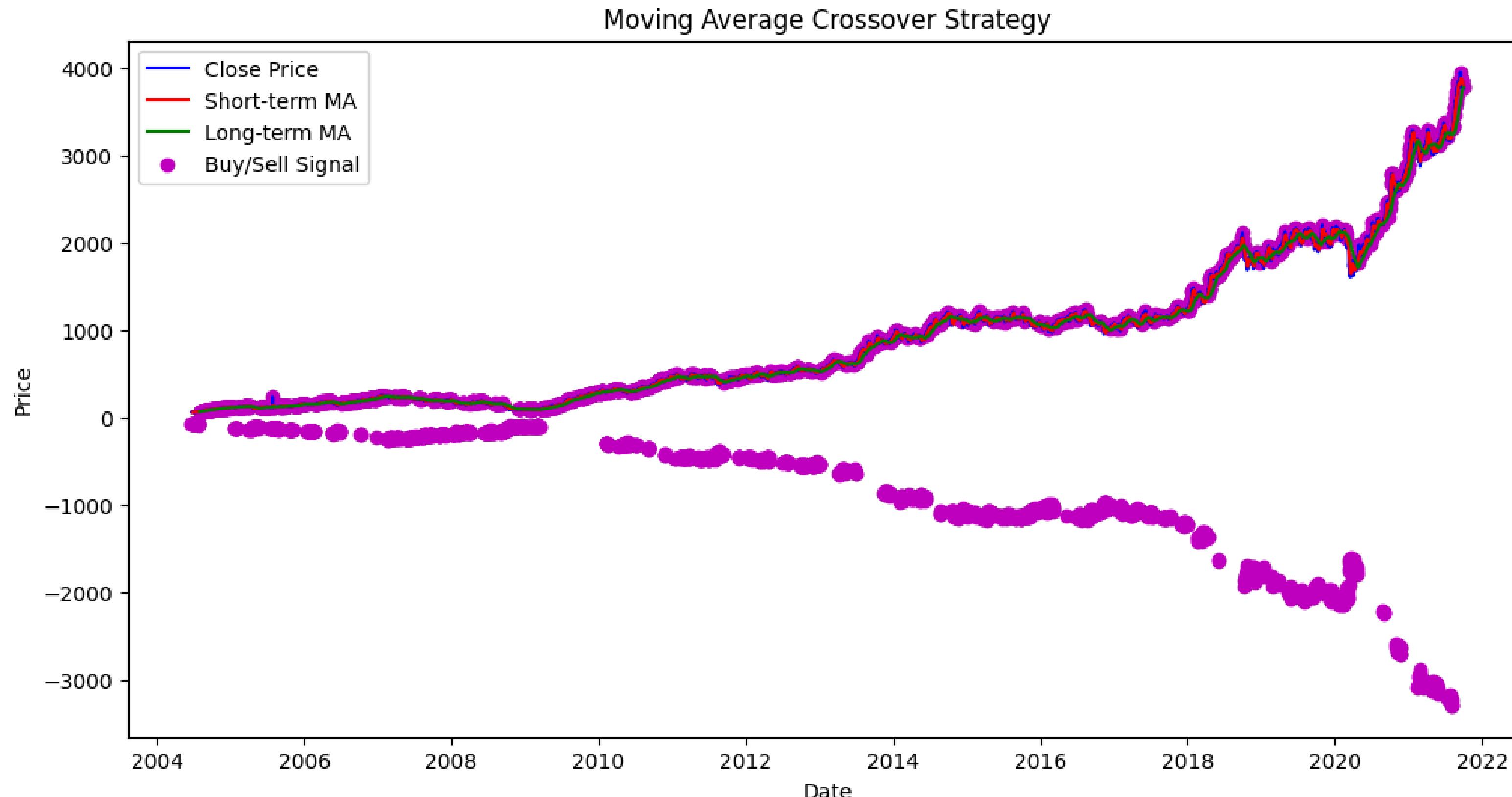
# Correlation of features with the target variable



# TCS Stock Price over Time



# Moving Average Crossover Strategy



| MSE | MSE   | Regression | R Squared | Score |
|-----|-------|------------|-----------|-------|
| 1   | MSE   | 18.55      | 12.5%     | 1.11  |
| 2   | MSE   | 15.51      | 5.97      | 1.11  |
| 2   | 15.50 | 15.85      | 5.55      | 4.99  |
| 4   | 10.50 | 19.55      | 5.12      | 1.09  |
| 4   | 1.00  | 18.55      | 5.19      | 1.03  |
| 5   | 9.00  | 18.51      | 55.5      | 1.03  |
| 5   | 0.10  | 15.51      | 71.0      | 1.00  |
| 6   | 0.37  | 25.51      | 25.0      | 1.00  |

# Evaluating Model Performance



The MSE of the model was 39.04992998516231.



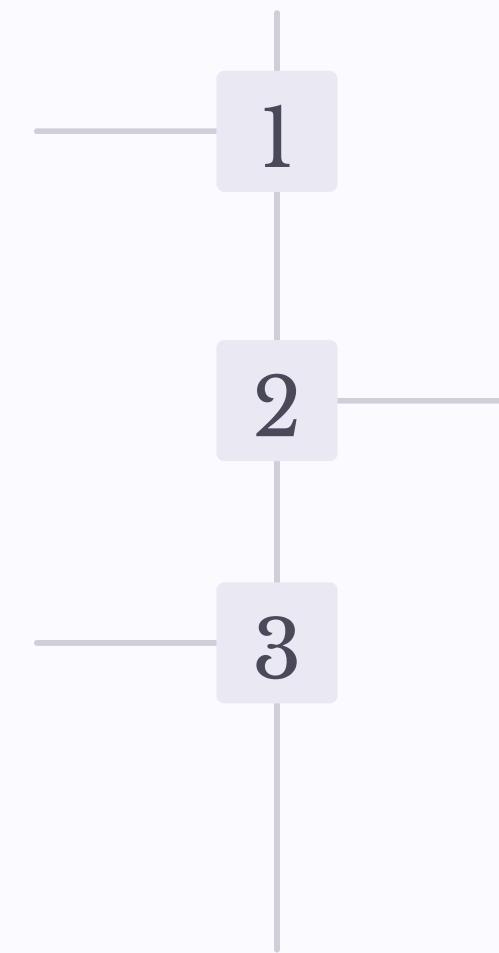
The R-Squared score of the model was 0.9999438356582193.



# Enhancing Predictive Capabilities

Consider using advanced machine learning models like Random Forest and XGBoost.

Implement Time-Series Analysis techniques like ARIMA for more accurate trend predictions.



Hyperparameter tuning can optimize the performance of the chosen ML model.

# Key Takeaways

## 1 Successful Analysis

We successfully analyzed historical TCS stock price trends and identified key patterns.

## 2 Data-Driven Insights

Moving averages and historical data proved valuable in providing actionable insights.

## 3 Future Directions

Future work will focus on implementing advanced machine learning models for improved predictions.



Thank  
You



CONTACT  
***Me***

Email :  
**ds075156@gmail.com**

LinkedIn :  
**<https://www.linkedin.com/in/dhruvsingh-data-analyst/>**

GitHub :  
**[https://github.com/dhru07/TCS\\_Stock\\_Data\\_Analysis UM](https://github.com/dhru07/TCS_Stock_Data_Analysis UM)**