MINOR - 2 PROJECT

END SEM PROJECT REPORT

For
PROJECT TITLE

"Stock Market Prediction Using Machine Learning Approach"

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SYNOPSIS REPORT

PROJECT TITLE

Stock Market Prediction Using Machine Learning Approach

1. ABSTRACT

In stock market prediction, the objective is the future value of the financial shares of a company. The recent trend in stock market prediction technology is machine learning to predict stock values. Factors Fairly Open, Close, Low, High, Volume.[1]

Key words: Simple Moving Average, Long Short Time Memory, SMA and STM, Stock market, Prediction, Machine learning, Artificial neural network.

2. INTRODUCTION

In today's time many people are interested in investing money in share market to earn more in less time.

Here, the stock market consists of a number of company shares along with the prices in the stock market, the share price will change every minute depending on the company's environment and the country's economic structure decisions. There are many brokers in the stock market to buy and sell stocks between the customers and the company. In previous years it is difficult to predict share market because there is lack of technology and knowledge but in present days technology is increasing day by day so we can predict share market easily when we compare in past Here we can predict the share price by analyzing the past. data using machine learning techniques. From these techniques we can use neural network (means it is connected networking, it looks like human neural brain structure) and simple moving average method.[2]

3. LITERATURE REVIEW

- Making financial business decisions is a robust and difficult task of fiscal data estimation. Picture about securities trading with high accuracy improved return profit for testers of stocks. In the context of a web of budgeted business financial data, the extension of productive models to prediction conclusions is very difficult, and must be precise. [3]
- It attempts to build models to prediction securities trading and select buy/hold stocks using data mining and AI techniques. AI frameworks such as Naive Bayes, k-Nearest Neighbors (k-NN), Support Vector Machine (SVM), Artificial Neural Network (ANN) and Random Forest have been used to progress the gauge model.
- The particular indicators are resolved from the stock prices established on the time table data and are used as commitments of the proposed estimation model. Ten years of securities trading data has been used to gauge the sign of the stock. Based on instructive accumulation, these models can create buy/hold signals for monetary trading in the form of yields. [4]
- The rule of this task is to give yield signals (buy/hold) according to the target clients, such as average contribution, time period.
- Least effort, least benefit, foremost difficulty, using data mining and AI frameworks. Predicting the way stock prices will behave is a widely studied topic in many fields, including business, finance, statistics, and computer science.
- Depositors in the stock market can maximize their yield by exporting or selling their investments if they can determine when to enter and when to exit a position. Specialized traders usually use essential and/or technical analysis to observe stocks in making venture decisions. [5]

4. PROPOSED SYSTEM

The proposed system for stock market prediction using machine learning involves data collection, preprocessing, feature engineering, model selection, training and testing, evaluation, and deployment. The system aims to use historical data to predict future stock market trends and is based on machine learning algorithms such as decision trees, random forests, neural networks, and support vector machines. The system will help investors make informed decisions and can be accessed through a user interface. [6]

5. PROBLEM STATEMENT

The stock market appears in the news every day. You hear about it every time it reaches a new high or a new low. The rate of investment and business opportunities in the Stock market can increase if an efficient algorithm could be devised to predict the short term price of an individual stock. [7]

6. OBJECTIVES

Stock market prediction using Deep Learning is done for the purpose of turning a profit by analyzing and extracting information from historical stock market data to predict the future value of stocks. One of the main aims of a trader is to predict the stock price such that we can sell it before its value decline, or buy the stock before the price rises. The efficient market hypothesis states that it is not possible to predict stock prices and that stock behaves in the random walk.[8]

7.METHODOLOGY

Stock market prediction is a huge topic and there are many parts to it that we can examine, but one thing all models have in common, it is a test of the accuracy of how well the empirical model predicts for a given dataset. Can fit well and is it similar to the results. And whether the prediction is correct or not. Each model has some similar implications, they all require a list of companies on any stock exchange to prediction on the three basic positions of the market buy, hold and sell and to do so for each company against the ticker was stock market data. Stored in the machine (to avoid large access times) and data manipulation was performed to prepare the dataset for additional machine learning classifiers that would eventually predict and output the scores. The productivity given to plaid the practicality of the overhead model would be plaid and coordinated and separate patterns with fixed company graphs for that period. [9]

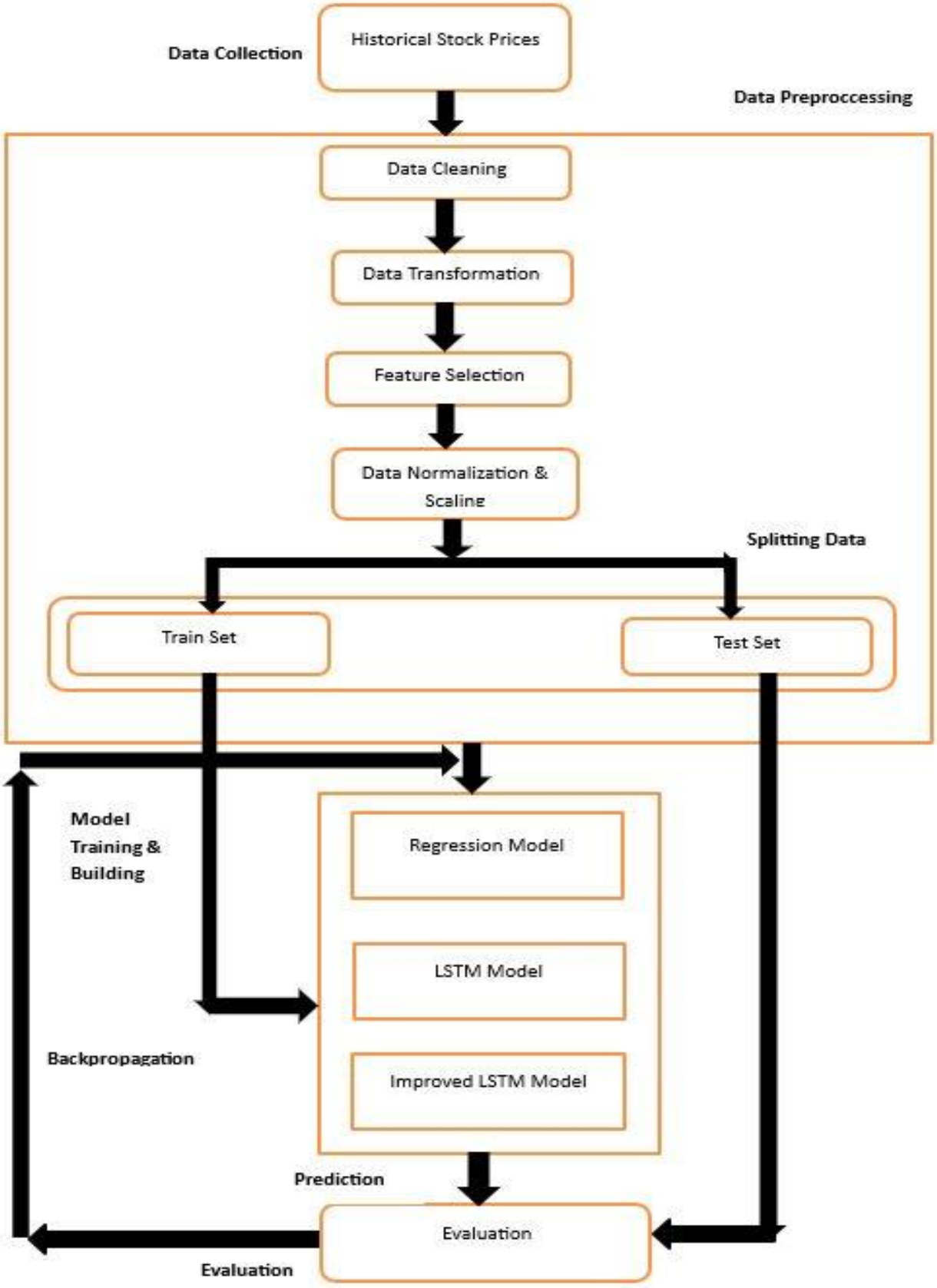


Fig - 1: METHODOLOGY FLOW CHART

8.PERT CHART

TIME LINE:

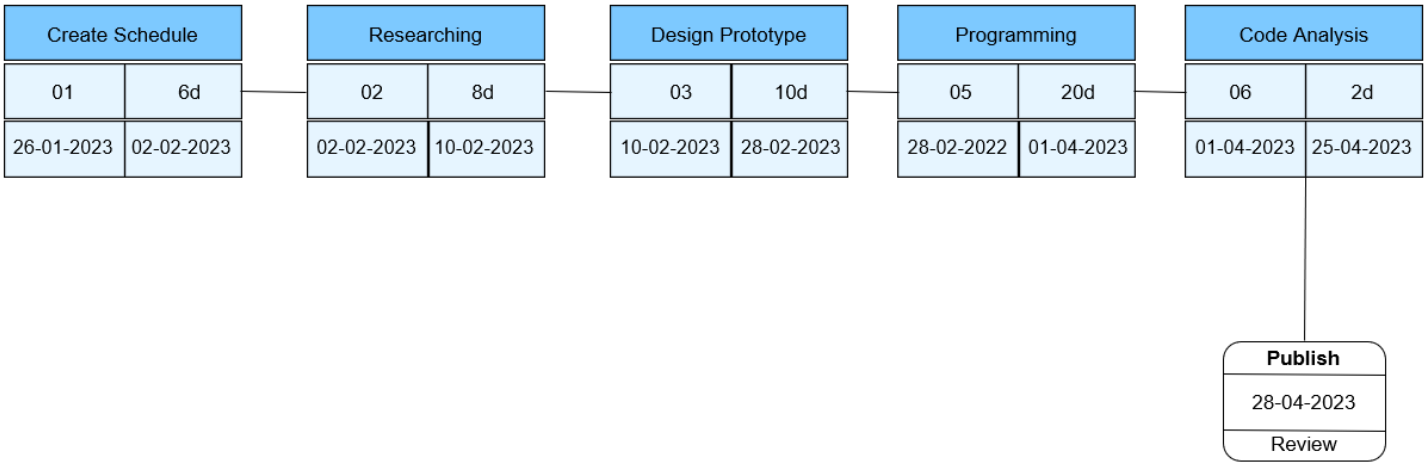
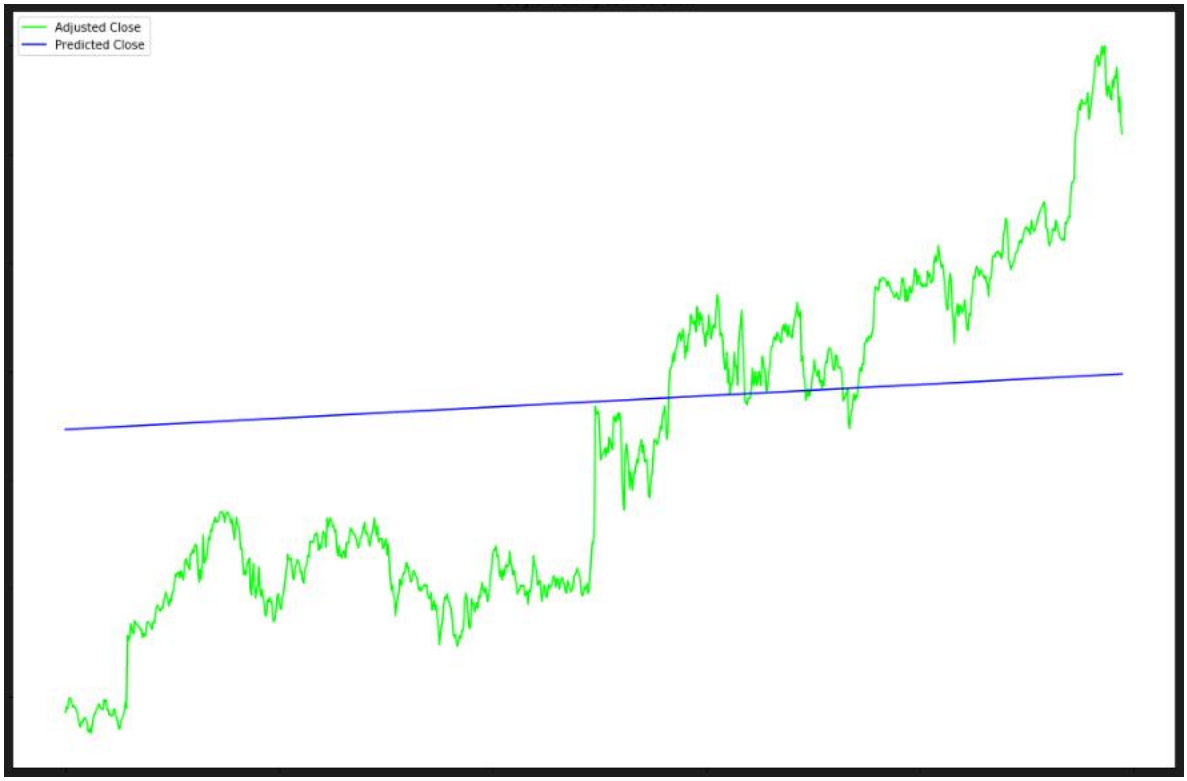


Fig-3: PERT CHART

9.RESULTS

Prediction using regression model



Accuracy of the Linear regression Model

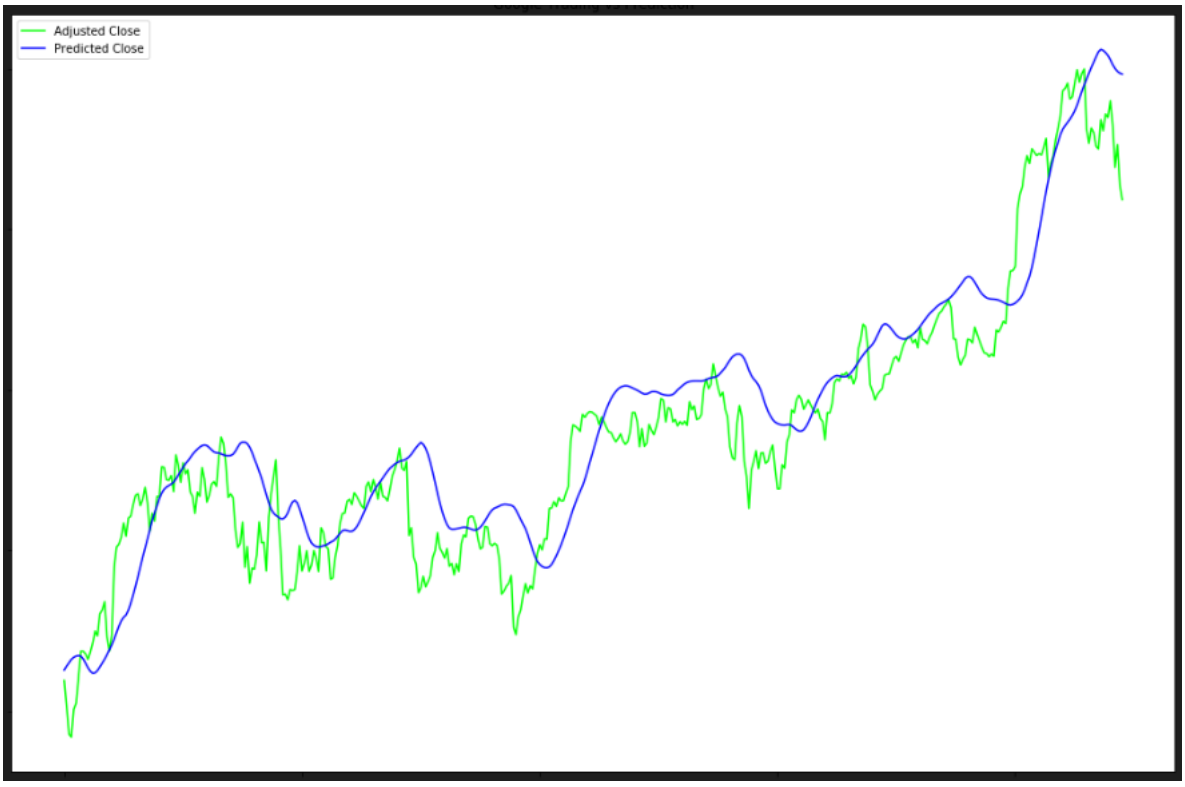
Step 6: measure accuracy of the prediction

```
trainScore = mean_squared_error(X_train, y_train)
print('Train Score: %.4f MSE (%.4f RMSE)' % (trainScore, math.sqrt(trainScore)))

testScore = mean_squared_error(predictions, y_test)
print('Test Score: %.8f MSE (%.8f RMSE)' % (testScore, math.sqrt(testScore)))
```

```
Train Score: 0.1852 MSE (0.4303 RMSE)
Test Score: 0.08133781 MSE (0.28519784 RMSE)
```

Prediction using LSTM Model:



Accuracy of LSTM Model

** Step 7:** Get the test score.

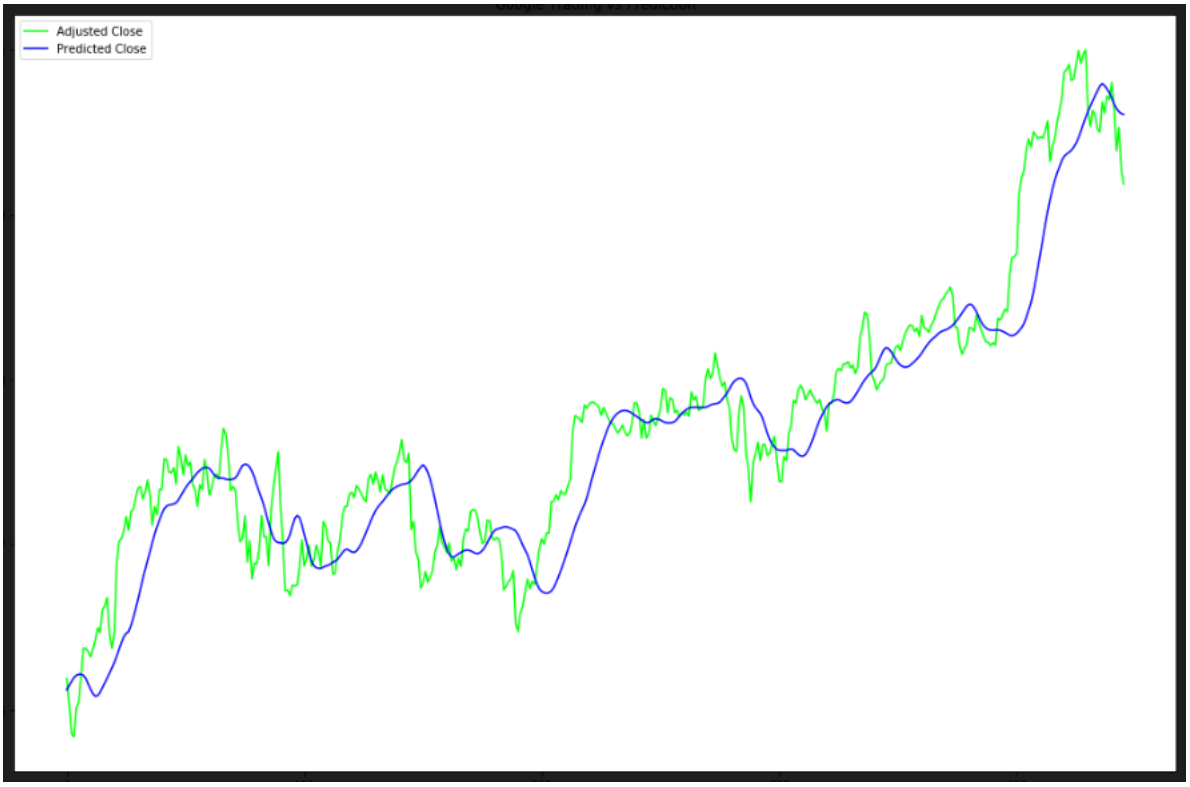
```
trainScore = model.evaluate(X_train, y_train, verbose=0)
print('Train Score: %.8f MSE (%.8f RMSE)' % (trainScore, math.sqrt(trainScore)))

testScore = model.evaluate(X_test, y_test, verbose=0)
print('Test Score: %.8f MSE (%.8f RMSE)' % (testScore, math.sqrt(testScore)))
```

[35]

```
Train Score: 0.00035862 MSE (0.01893715 RMSE)
Test Score: 0.00109616 MSE (0.03310835 RMSE)
```

Prediction of Improved LSTM model



Accuracy Improved LSTM Model

Step 5: Get the test score

```
trainScore = model.evaluate(X_train, y_train, verbose=0)
print('Train Score: %.8f MSE (%.8f RMSE)' % (trainScore, math.sqrt(trainScore)))

testScore = model.evaluate(X_test, y_test, verbose=0)
print('Test Score: %.8f MSE (%.8f RMSE)' % (testScore, math.sqrt(testScore)))
```

```
Train Score: 0.00031550 MSE (0.01776241 RMSE)
Test Score: 0.00099105 MSE (0.03148098 RMSE)
```

Robustness of the Model

Checking Robustness of the model

In this section we will check robustness of our LSTM model. I have used new unseen datasets for this

```
import preprocess_data as ppd

data = pd.read_csv('C:\Users\User\OneDrive\Desktop\Stock-Price-Predictor-master\googl.csv')

stocks = ppd.remove_data(data)

stocks = ppd.get_normalised_data(stocks)

stocks = stocks.drop(['Item'], axis = 1)
#Print the dataframe head and tail
print(stocks.head())

X = stocks[:].as_matrix()
Y = stocks[:]['Close'].as_matrix()

X = sd.unroll(X,1)
Y = Y[-X.shape[0]:]

print(X.shape)
print(Y.shape)

# Generate predictions
predictions = model.predict(X)

#get the test score
testScore = model.evaluate(X, Y, verbose=0)
print('Test Score: %.4f MSE (%.4f RMSE)' % (testScore, math.sqrt(testScore)))
```

```
       Open     Close    Volume
0  0.123901  0.000000  0.606442
1  0.000000  0.174601  1.000000
2  0.010989  0.112263  0.921928
3  0.093132  0.291229  0.575381
4  0.243819  0.430228  0.366556
(12, 1, 3)
(12,)
Test Score: 0.3842 MSE (0.6198 RMSE)
```

10.CONCLUSION & FUTURE SCOPE

In conclusion, stock market prediction is a challenging and complex problem that has been the focus of research for many years. While machine learning and statistical models have been used to make predictions with varying degrees of success, there is still a significant amount of uncertainty and unpredictability in the stock market that makes accurate predictions difficult.

Looking to the future, there are several areas where stock market prediction can be further improved. One area is the incorporation of more complex data sources such as satellite imagery and geospatial data to gain insights into the activities of companies and their supply chains. Another area is the use of more advanced reinforcement learning techniques to optimize trading strategies based on predicted market trends.[10]

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