

# STOCK MARKET PREDICTION

*Shobha Bagai, Muskan Nagi, Nandan Kumar, Piyush Kr. Arun, Pratibha Dohare*  
Cluster Innovation Centre, University of Delhi, Delhi-110007, India  
nandank162000@gmail.com

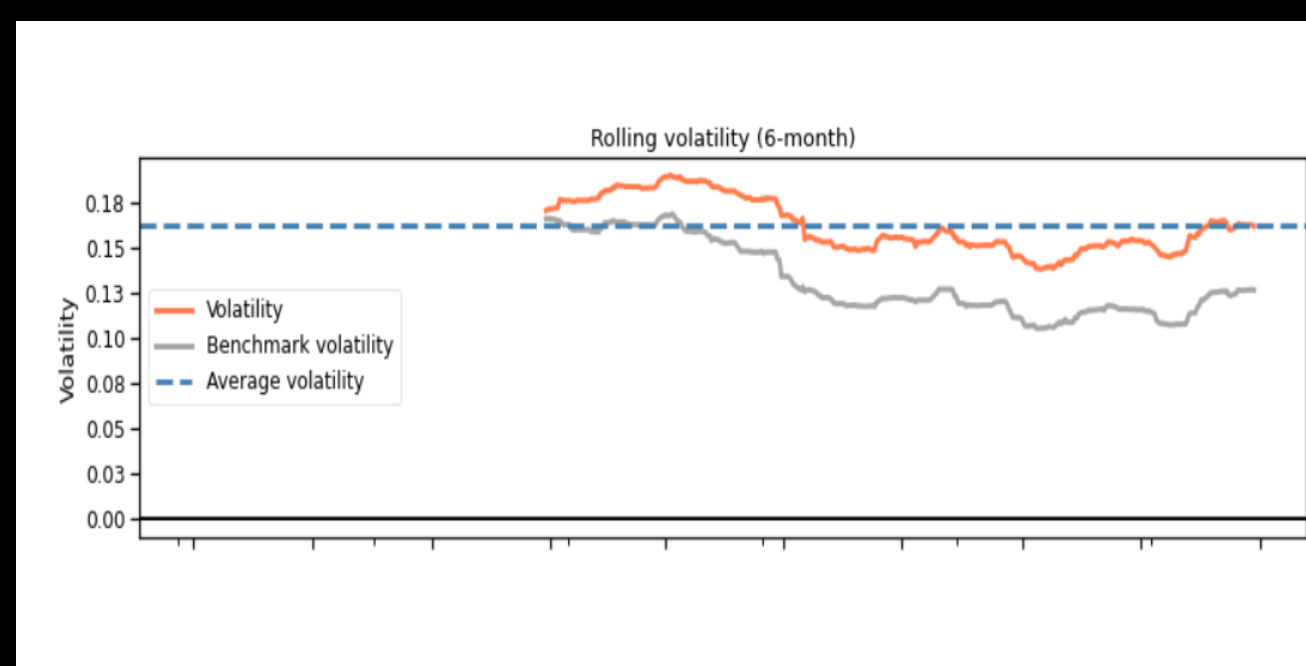
## INTRODUCTION

Over the past decades, interest in prediction of markets has increased among the market makers. But before anyone invests in any stocks, they need to know how the stock market works otherwise they will gain a big loss. Prediction of the stock market is basically based on time-series. Different algorithms have been used to predict stock prices and then their accuracy score was compared. Long-short term memory model shows the highest accuracy of 92% among Linear Regression, Random Forest, Support Vector Machines and ARIMA family of techniques. Proposed web app was built using the LSTM model.

## EXPERIMENTAL DETAILS

Different stock price prediction models have been built using Linear Regression, Random Forest, Support Vector Machine, ARIMA (Auto-Regressive Integrated Moving average) and LSTM (Long-Short Term Memory) techniques. Then the accuracy scores of all algorithms have been evaluated and it was found that LSTM models have the highest accuracy of 92%. We found that the LSTM model works best with stock data of the company.

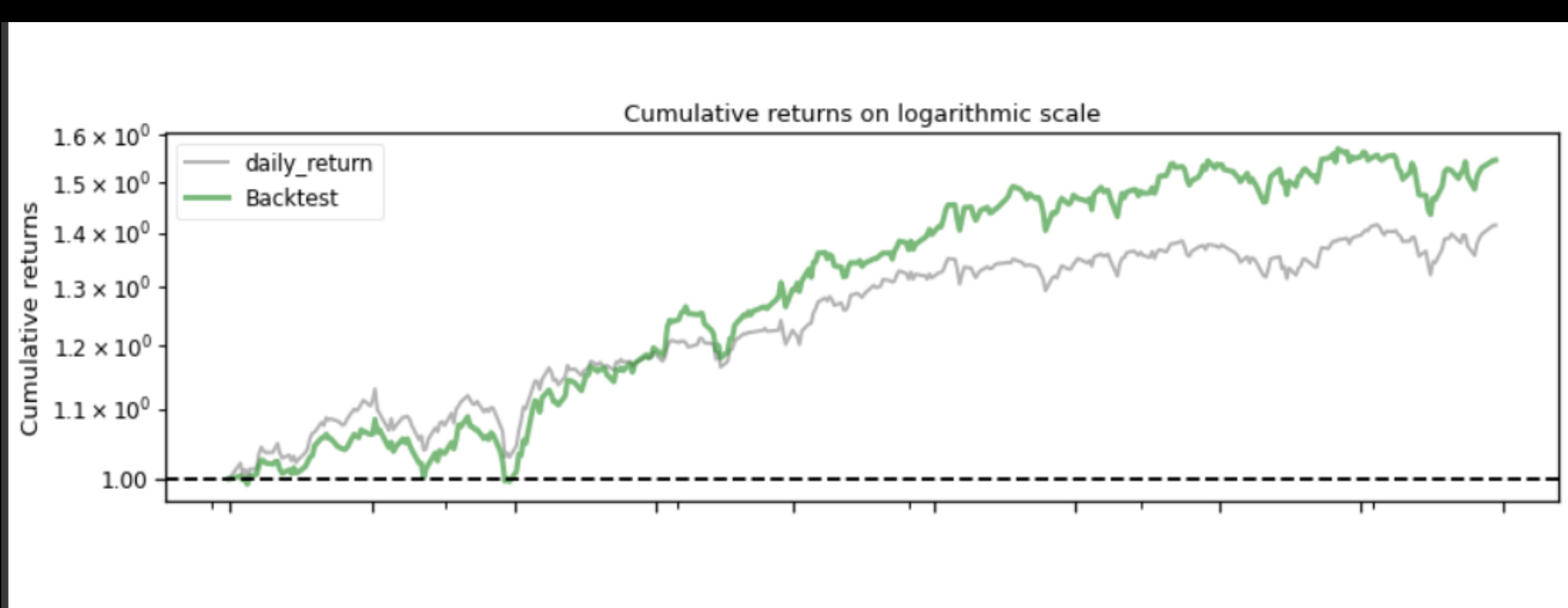
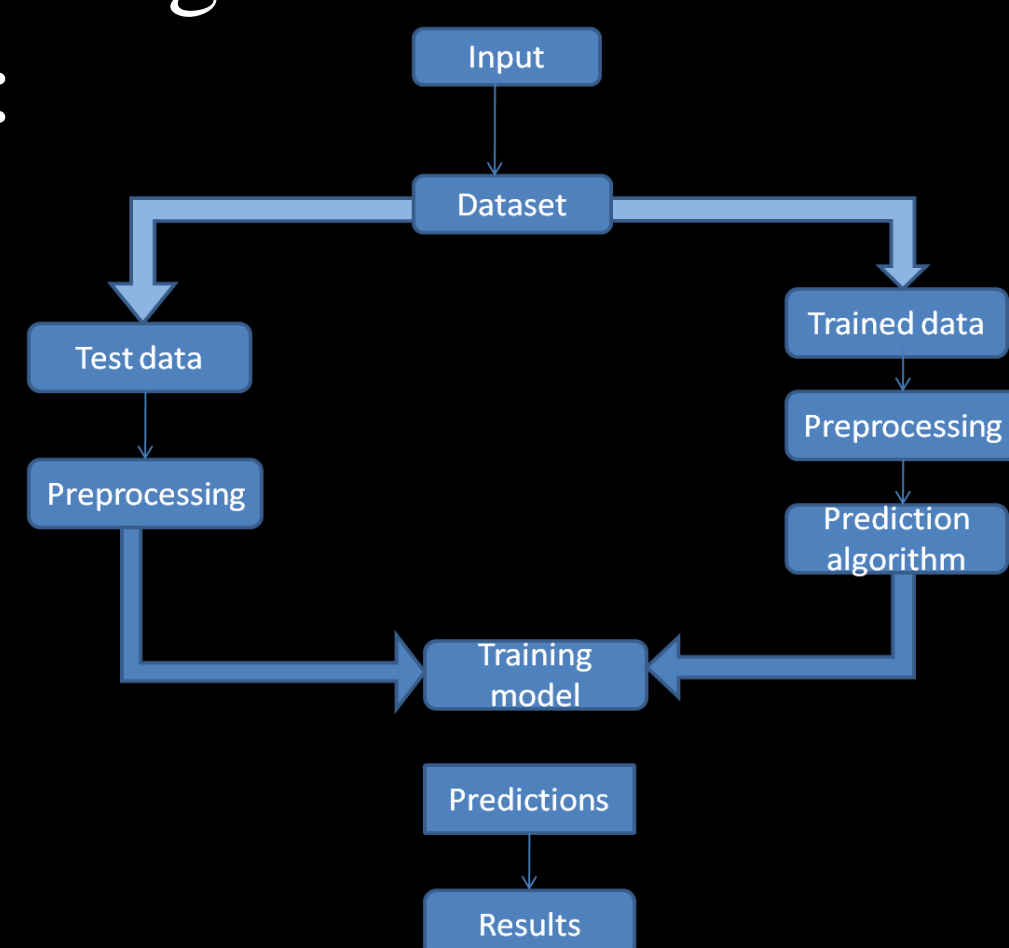
Stock Name	Combined Accuracy	Linear Regression	Random Forest	SVM	ARIMA	LSTM
Apple	*Combined accuracy	61.12	82.20	80.31	86.85	89.88
Microsoft	*Combined accuracy	59.89	83.01	82.67	87.76	91.99
Reliance	*Combined accuracy	62.38	86.00	85.03	89.31	90.37
Face book	*Combined accuracy	60.29	87.46	87.4	88.01	88.44
Google	*Combined accuracy	63.33	83.86	81.88	90.137	92.28



## METHODOLOGY

Input data is taken from Yahoo Finance. The problem is solved using different algorithms and their accuracies are compared. The different supervised algorithms and neural network techniques are listed below:

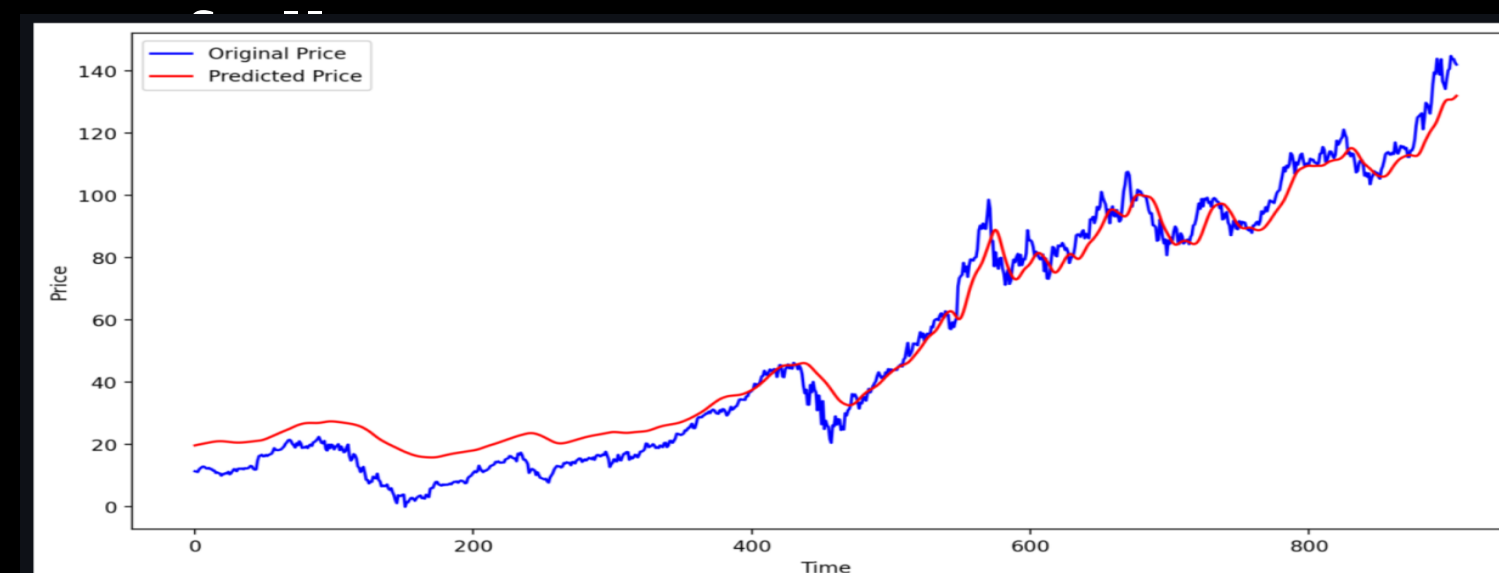
- Linear Regression
- Random Forest
- Support Vector Machines
- ARIMA Family of Techniques
- Long-Short Term Memory



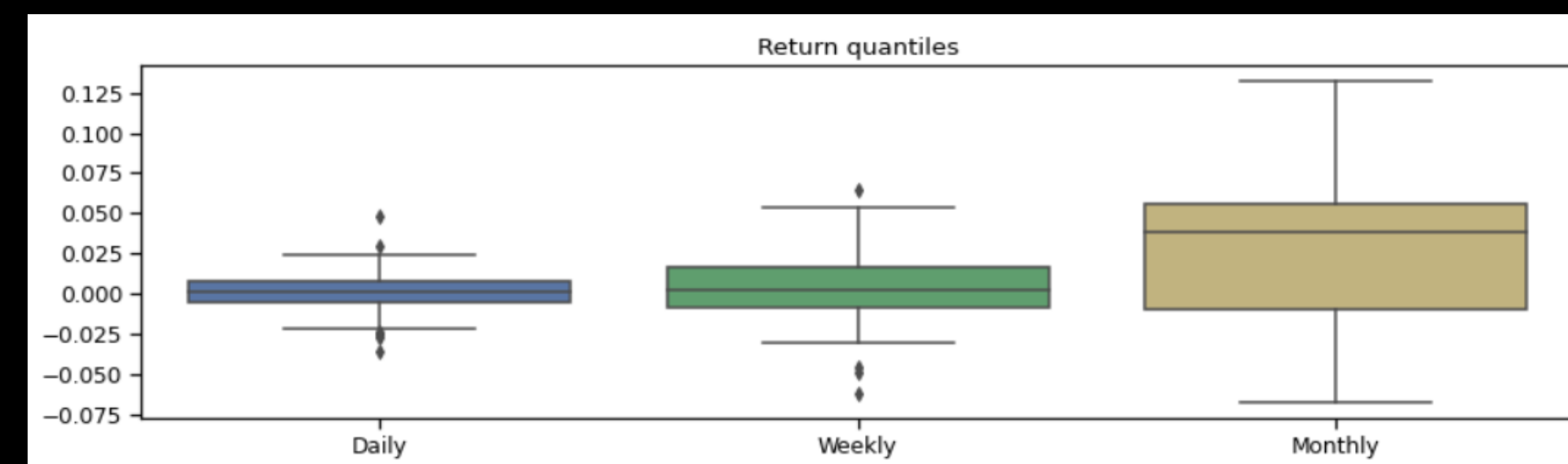
Cummulative returns of stock

## RESULTS AND DISCUSSION

The predicted price v/s actual price of stocks are



Return Quantities (Daily, Monthly and annually) with Dummy Money are as follows



Profits Referenced with Dummy Money

```
trained_sac = agent.train_model(model=model_sac,
                                tb_log_name='sac',
                                total_timesteps=60000)

day: 2892, episode: 70
begin_total_asset: 1000000.00
end_total_asset: 4373045.80
total_reward: 3373045.80
total_cost: 145506.00
total_trades: 51142
Sharpe: 0.699

-----
time/      episodes | 4
fps        | 21
time_elapsed | 536
total_timesteps | 11572
train/
actor_loss | 777
critic_loss | 418
ent_coef   | 0.142
```

## CONCLUSION

- In this project, the stock price of any given organization is predicted using LSTM algorithm for prediction. We have applied datasets belonging to Google, Apple and Reliance Stocks and achieved above 92% accuracy for these datasets. We also tried an automated predictor in which we used dummy money which gave us profitable results as you can see in the figure above.

## FUTURE WORK

- We will try to make it fully automated and diverse so that it can be more profitable.
- We will also implement a news dependent predictor so that it can also work on behalf of the situations going on in the world.