Stock Market Prediction Using LSTM
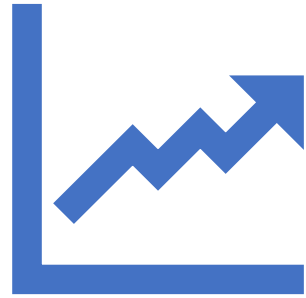
By

Shree Shylesh N

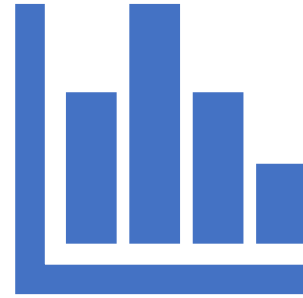Gokul Ganesh I

Vijay Kumar P

Problem Statement

Stock market prediction is the act of trying to determine the future value of a company stock or other financial instrument traded on an exchange. The successful prediction of a stock's future price could yield significant profit.

Methodologies to solve the problem

Traditional approach to Stock market analysis

Modern approach to Stock market analysis

Limitations of traditional approach in Stock Market analysis

- Fundamental analysis
- Technical analysis
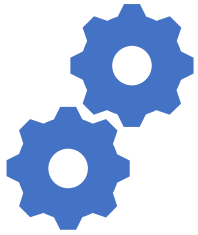
Modern approach to Stock market analysis

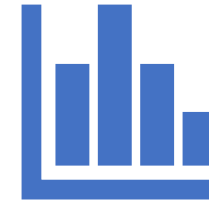Qualitative Analysis

Quantitative Analysis

System design

Technical Analysis

Data Extraction

Data Manipulation

Chosen Dataset

The Dataset we chose is regarding the stock prices of Google from 2013-2017.We got this Dataset from Kaggle and used it for our predictions.

Dataset

	Date	Open	High	Low	Close	Adj Close	Volume
0	2013-01-02	357.385559	361.151062	355.959839	359.288177	359.288177	5115500
1	2013-01-03	360.122742	363.600128	358.031342	359.496826	359.496826	4666500
2	2013-01-04	362.313507	368.339294	361.488861	366.600616	366.600616	5562800
3	2013-01-07	365.348755	367.301056	362.929504	365.001007	365.001007	3332900
4	2013-01-08	365.393463	365.771027	359.874359	364.280701	364.280701	3373900
...	...	...	...	...	...	...	...
1254	2017-12-22	1061.109985	1064.199951	1059.439941	1060.119995	1060.119995	755100
1255	2017-12-26	1058.069946	1060.119995	1050.199951	1056.739990	1056.739990	760600
1256	2017-12-27	1057.390015	1058.369995	1048.050049	1049.369995	1049.369995	1271900
1257	2017-12-28	1051.599976	1054.750000	1044.770020	1048.140015	1048.140015	837100
1258	2017-12-29	1046.719971	1049.699951	1044.900024	1046.400024	1046.400024	887500

Existing Models For Stock Prediction

Linear Regression.

Logistic Regression.

K-NN

Random Forest

Proposed Model

We have done our prediction using a neural network called LSTM.

We have chosen this neural network as many have done stock prediction using linear regression and logistic regression.

So we took a neural network and did our predictions.

Output of our Proposed Model

```python
plt.plot(real_stock_price,color = 'red', label = 'Real Price')
plt.plot(predicted_price, color = 'blue', label = 'Predicted Price')
plt.title('Google Stock Price Prediction')
plt.xlabel('Time')
plt.ylabel('Google Stock Price')
plt.legend()
plt.show()
```
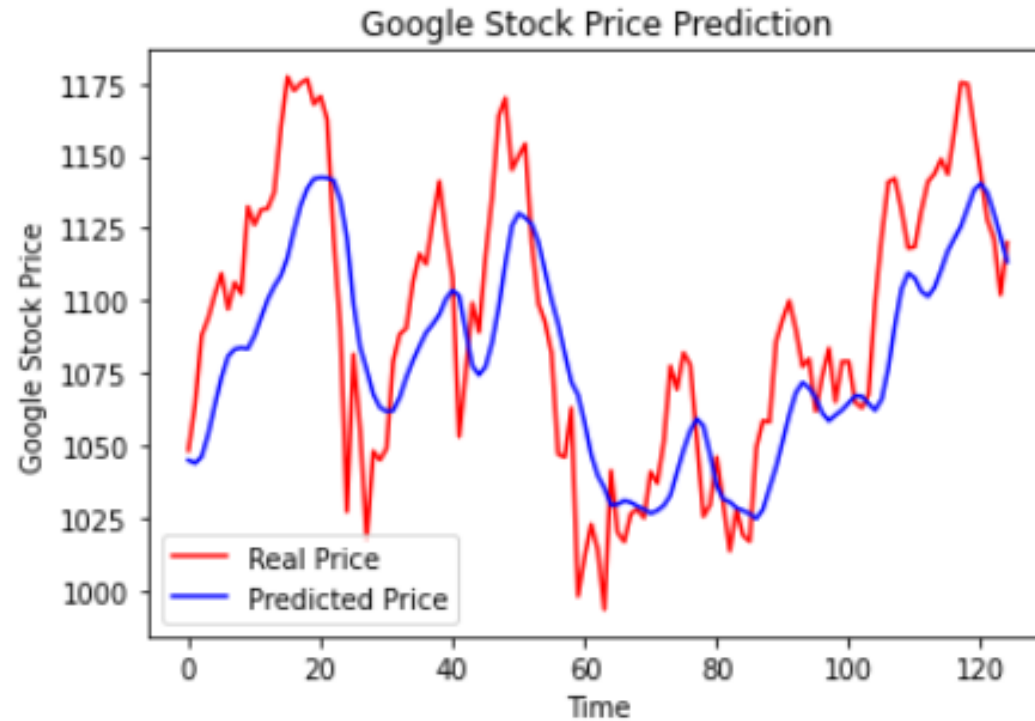
Mathematical modelling and analysis behind your problem

- Our model was created using LSTM(Long short term Memory) which is a neural network.
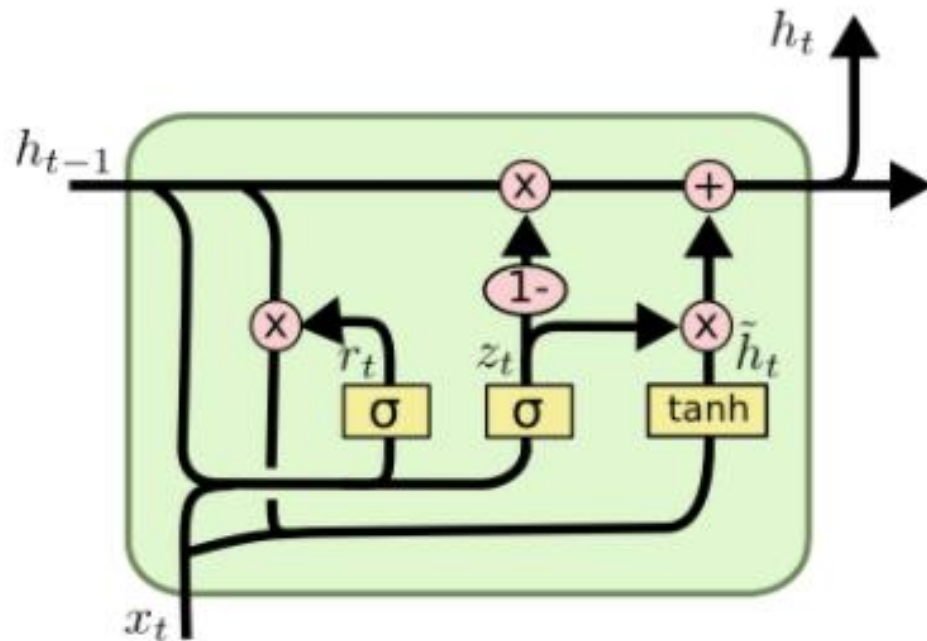
$$z_t = \sigma \left(W_z \cdot [h_{t-1}, x_t] \right)$$

$$r_t = \sigma \left(W_r \cdot [h_{t-1}, x_t] \right)$$

$$\tilde{h}_t = \tanh \left(W \cdot [r_t * h_{t-1}, x_t] \right)$$

$$h_t = (1 - z_t) * h_{t-1} + z_t * \tilde{h}_t$$

Result analysis

- Hence, using our model we can predict the stock price more accurately compared to the previous models as we use more reliable neural network.

- This helps many stakeholders to decide when to buy or sell a stock (I.e.) our model predicts the stock price of various companies in a more accurate manner.

Outcome

Using our Model, we can help those who wish to buy stocks in a particular company by showing the analysis of the stock price of that company in a more simplified manner and our model also helps them to foresee the stock price of the particular company.

Contribution of each of the team members

Shree Shylesh N - Training and building the **model**, Collecting Dataset, Evaluate Algorithm

Gokul Ganesh I - Standardizing the dataset and Preprocessing it to the meet the needs of our model and documentation part.

Vijay Kumar P - Data visualization, Tested Accuracy, Defined Problem, Improve the Results

Conclusion

- We have implemented stock prediction model using LSTM. It is implemented using LSTM and standardized using Minimax Scalar.

- This model predicts the stock price for the upcoming days using the data from previous days and this model can be improved by using more past data's as we can train the model even more to get more accurate results.

Publication Status

Dear Subbulakshmi, Nirmala Devi and N.Shree Shylesh,

Thank you for submitting your preprint

 Stock Price Prediction using LSTM

for publishing with EasyChair.

It looks like you intended to make a conference submission.
If we made a mistake and you intended to publish an EasyChair
preprint, just submit your preprint for publishing again.

If you did not intend to publish a preprint and wanted to make
a conference submission or upload files for your conference
submission, you should delete the preprint.

To access you preprint in EasyChair you should use the menu tab
"Preprints" from "My EasyChair" environment. If you are in a
different environment, use menu tabs "EasyChair -> My
preprints".

If you have any questions about your preprint, please write us to
EasyChair preprints <preprints@easychair.org>.

When writing to us, please use the preprint title and, if the
preprint is published, also the preprint number.

Best regards,
EasyChair support

References

1) Procedure," 2015 7th International Conference on Intelligent Human-Machine

2) Systems and Cybernetics, Hangzhou, 2015, pp. 381-384. P. D. Yoo, M. H. Kim and T. Jan, "Machine Learning Techniques and Use of Event

3) Information for Stock Market Prediction: A Survey and Evaluation," International

4) Conference on Computational Intelligence for Modelling, Control and Automation

5) and International Conference on Intelligent Agents, Web Technologies and Internet

6) Commerce (CIMCA-IAWTIC'06), Vienna, 2005, pp. 835-841. M. Qasem, R. Thulasiram and P. Thulasiram, "Twitter sentiment classification using

7) machine learning techniques for stock markets," 2015 International Conference on

8) Advances in Computing, Communications and Informatics (ICACCI), Kochi, 2015,

9) Scientific Computing (SYNASC), Timisoara, 2015, pp. 391-398.

10) Hellstrom, T. and Holmstrom, K. 1998, 'Predicting the Stock Market', Technical

Thank You