Reviewer 2

It was demonstrated that forecasting the NIFTY50 Price using LSTM and BE-LTSM was fruitful. This is consistent with the expected power and utility of artificial intelligence-based techniques for stock market prediction.

Comment: I recommend giving mathematical formulas for calculating the accuracy, precision and recall characteristics.

Ans: Accuracy

Accuracy serves as a metric that offers a broad overview of a model's performance across all classes. It proves particularly valuable when all classes hold equal significance. This metric is computed by determining the proportion of correct predictions in relation to the total number of predictions made.

$$Accuracy = \frac{True_{positive} + True_{negative}}{True_{positive} + True_{negative} + False_{positive} + False_{negative}}$$

Calculating accuracy with Scikit-learn based on the previously computed confusion matrix is as follows: We store the result in the variable accuracy by dividing the sum of True Positives and True Negatives by the sum of all values within the matrix.

Precision

Precision is computed by taking the proportion of correctly classified Positive samples relative to the total number of samples classified as Positive, whether correctly or incorrectly. Precision serves as a metric for gauging the model's accuracy when it comes to classifying a sample as Positive.

$$Precision = \frac{True_{positive}}{True_{positive} + False_{positive}}$$

When the model generates numerous incorrect Positive classifications or only a few correct Positive classifications, this elevates the denominator and results in a lower precision score. Conversely, precision is higher under the following conditions:

The model produces a substantial number of correct Positive classifications, thus maximizing True Positives.

The model minimizes the number of incorrect Positive classifications, thereby reducing False Positives.

Recall

Recall is determined by the ratio of correctly classified Positive samples to the total number of Positive samples. It quantifies the model's capacity to identify Positive samples. A higher recall score signifies a greater ability to detect Positive samples.

$$Recall = \frac{True_{positive}}{True_{positive} + False_{negative}}$$

Recall exclusively focuses on the classification of positive samples and is independent of the classification of negative samples, as observed in precision. If the model categorizes all positive samples as Positive, even if it incorrectly labels all negative samples as Positive, the recall will still register at 100%.

Comment: Quantification of prediction success can be improved. Adding characteristics of Win ratio, profit loss ratio, profit factor, and profitability would give a better insight into the success of the prediction. Cf. The Profitability Rule. URL:
http://www.priceactionlab.com/Literature/profitability.pdf

Ans: This Paper is developed as a comparative analysis of two Deep learning model LSTM and BE-LSTM. To analyse the suitable model for predicting price closer to real time price. However, the same work is being done for global data in my another research work along with P/L calculation, profit factor in another research work which is extensions of the paper and under progress.

Comment: It needs to be made clear from the text which variables and from which times are used as explanatory variables in the model. Unfortunately, references to using HOLC and RSI without the specified details are insufficient.

| Ans: **Const** | **Attributes/ Column name** |
|---|---|
| X1 | DATE |
| X2 | OPEN |
| X3 | HIGH |
| X4 | LOW |
| X5 | VOL |
| X6 | VALUE |
| X7 | TRADE |
| X8 | RSI |

Comment: I need help understanding the application of the Z-test in the hypothesis of equality of probabilities H0: p=s/n = p0=s0/n. /line 215/

Ans: Is implemented in paper.

Comment: When describing the LSTM, I am missing information about the vector length assigned to the node. /line 223/

Ans: The vector length is 64. Is included in paper.

Comment: The function/matrix P_e, P_j, P_m is not explained. /lines 259,265, 266/

Ans: Pe represents weight matrix associated with the forget gate

Pj represents weight matrix associated with input gate

Pm represents weight matrix associated with output gate

Is included in paper.

Comment: What is the difference between w and W? /line 259,265,266 x 268/

Ans: Is typo error all are capital.

Comment: Commas and a dot are missing after formulas (6), (7), and (8).

Ans: Is Included

Comment: Tab. 5, what is an omnibus?

Ans: The word "omnibus" in backward elimination model selection often denotes a statistical test or metric that evaluates the overall fit of a regression model prior to deleting predictor variables. It aids in determining if the model is statistically significant in explaining the fluctuation of the dependent variable as a whole.

Comment: Tab. 5, 6, 7: Instead of const., X1, X2, ..., X8, it is more appropriate to write the estimate \hat{beta}_0, \hat{beta}_1, ..., \hat{beta}_7.

Ans: instead X1, Beta1

Comment: L-Jung box test /Ljung–Box test; cite a reference

Ans: added

Idrees, S. M., Alam, M. A., & Agarwal, P. (2019). A prediction approach for stock market volatility based on time series data. *IEEE Access*, *7*, 17287-17298.

augmented Dickey–Fuller test; reference

Vaisla, K. S., & Bhatt, A. K. (2010). An analysis of the performance of artificial neural network technique for stock market forecasting. *International Journal on Computer Science and Engineering*, *2*(6), 2104-2109.