STOCK MARKET PREDICTION:A DEEP LEARNING APPROACH USING LSTM AND GRU

21AIE214

TEAM 10

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Introduction

- Shares of publicly traded companies are traded on the stock market. The stock market has a reputation for being unpredictable, random, and volatile.

- It is a chaotic environment with an unbelievable amount of constantly changing data, which makes it challenging to anticipate the future and take profitable action based on those predictions. In fact, it is among the most difficult challenges in times series forecasting.

- Stock market forecasting has drawn a lot of interest from both the business world and academia. Research has used machine learning techniques for stock forecasting, including decision trees, genetic algorithms, support vector machines, logistic regression, and deep learning network models.

- LSTM network models and GRU network models have grown in popularity as a subject of study in recent years.

Aim & Objective

In this study, we examined the efficiency of two deep learning techniques , LSTM(Long Short Term Memory) and GRU (Gated Recurrent Unit) for predicting the tomorrow's stock market value. We examined the best model by seeing the root mean square error. GRU is the Gated Recurrent unit which will automatically update the hidden state of network , it has two state of mechanism which is reset and update mechanism of the gates. We used Adam Optimizer which is used to optimize the model and gives the précised output

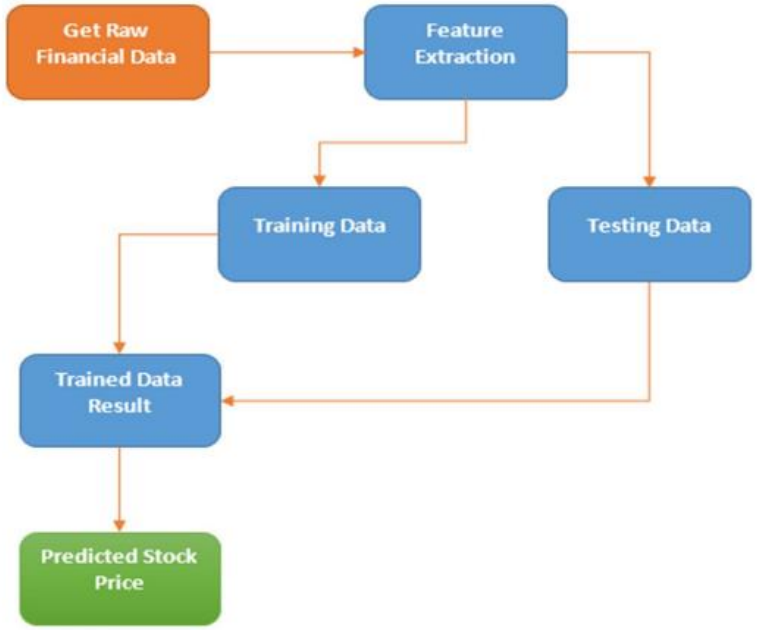
Literature Survey

Year	Existing Work	Limitations
2018	Stock market prediction using neural network through news on online social networks	An influence feature is derived based on the public moods to further improve the prediction model.
2019	Stock market value prediction using neural networks	In this paper, two kinds of neural networks, a feed forward multi layer Perceptron (MLP) and an Elman recurrent network, are used to predict a company's stock value based on its stock share value history. The experimental results show that the application of MLP neural network is more promising in predicting stock value changes rather than Elman recurrent network and linear regression method.
2021	Stock Market Prediction Using Artificial Neural Networks	In this study we apply back propagation Neural Network models to predict the daily Shanghai Stock Exchange Composite Index. The learning algorithm and gradient search technique are constructed in the models. We evaluate the prediction models and conclude that the Shanghai Stock Exchange Composite Index is predictable in the short term.

Proposed Algorithm

LSTM : (Long Short Term Memory):

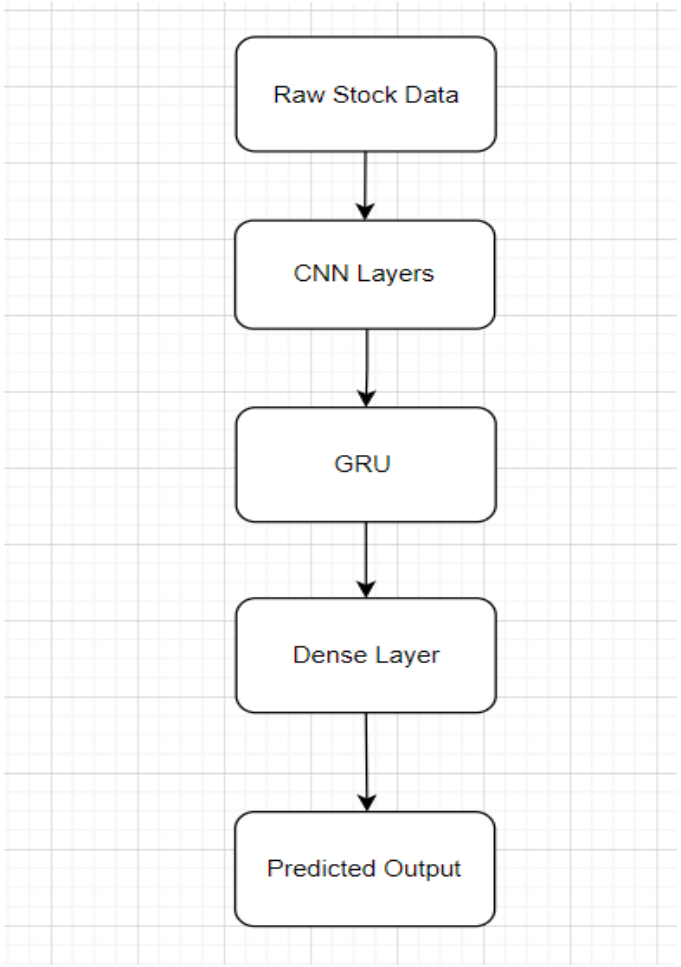
- Our experiment consists of four main steps: Data preparation, Feature extraction, Model training, Validating the data and Prediction and validation.
- In this experiment we implemented the model using the Tensorflow Library.
- We got the data from the Yahoo Finance website so that we can take the value lively.



Proposed Algorithm

GRU: (Gated Recurrent Unit)

- Importing the necessary Libraries
- Pre-processing the given dataset
- Using Graph we are visualising the current data trend
- Checking for any null values by the command df.shape()
- Selecting the features and the Target variable
- Dividing the dataset into Train data set and Test data set in the ratio of 80:20
- Developing the layers to build the LSTM model and GRU
- Training the dataset into the model which we build
- LSTM Prediction vs GRU Prediction
- Compare the True value and the Predicted Value



Result

- In this experiment we established the Percentage of error which is for LSTM is 21% and in GRU the percentage of error is 18% .
- From this experiment we concluded that for time series function prediction GRU (Gated Recurrent Unit) is suitable method to predict the stock market values.

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1/1 [==============================] - 0s 29ms/step
Price of Bitcoin tomorrow:[[2366567.8]]
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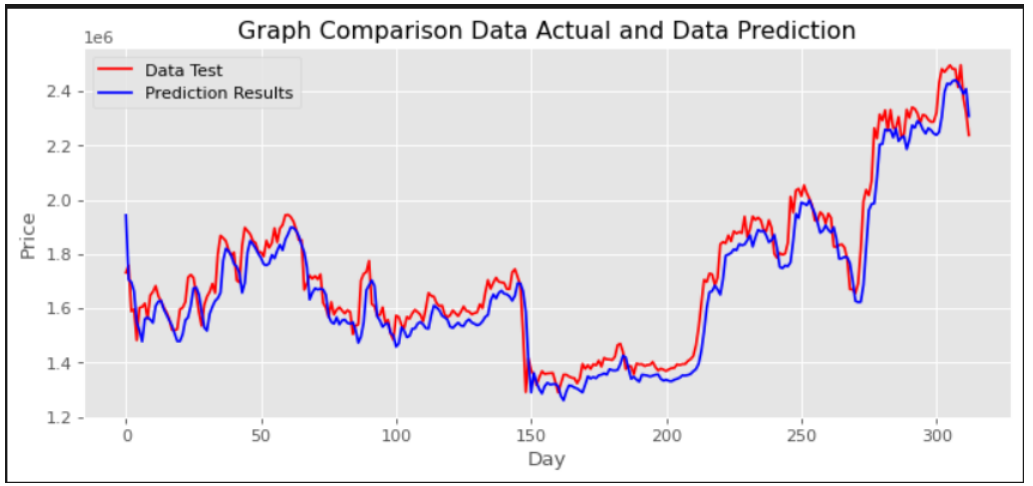

Future Works

Through this experiment we can able to find only one stock values of the Company or shares. In future we can able to train the model where it will automatically update the stock values for that we need to use hybrid models (combination two methods).

The End