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TITLE :  predict stock prices based on historic data using LSTM/GRU

LAB NO: 7

PROBLEM STATEMENT :  develop an algorithm and write a program to predict the stock prices based on historic data using LSTM/GRU

METHODOLOGY :

* Collect and pre process the data by removing any missing values, scaling the data and splitting into training and testing sets.
* Create an LSTM model with one or more hidden layers. Input layers should have the number of neurons equal to the that of the features of the output layers.
* Train the LSTM model on training data and using a suitable optimization technique and appropriate batch size and number of epochs.
* Use this trained model to make predictions on testing data.
* Evaluate the model using metrics such as MSE and correlation coefficients.

APPLICATIONS:

* Common LSTM applications include sentiment analysis, language modeling, speech recognition, and video analysis.

RESULTS :

* The loss goes on decreasing as the number of epochs keeps increasing.
* The loss is as low as 0.0036 on just the 20th epoch, giving an accuracy of 99%

OBSERVATION :

* the LSTM ( Long -short-term memory ) and GRU ( Gated Recurrent Unit ) have gates as an internal mechanism, which control what information to keep and what information to throw out. By doing this LSTM, GRU networks solve the exploding and vanishing gradient problem.
* This also means that the computational time will be lower as compared to CNN and the model will not be as dependent on the hyperparameters as compared to CNN

CONCLUSION :

* The key difference between GRU and LSTM is that GRU's bag has two gates that are reset and update while LSTM has three gates that are input, output, forget. GRU is less complex than LSTM because it has less number of gates. If the dataset is small then GRU is preferred otherwise LSTM for the larger dataset.

PRINT OF CODE AND OUTPUT