Table of Contents

Abstract

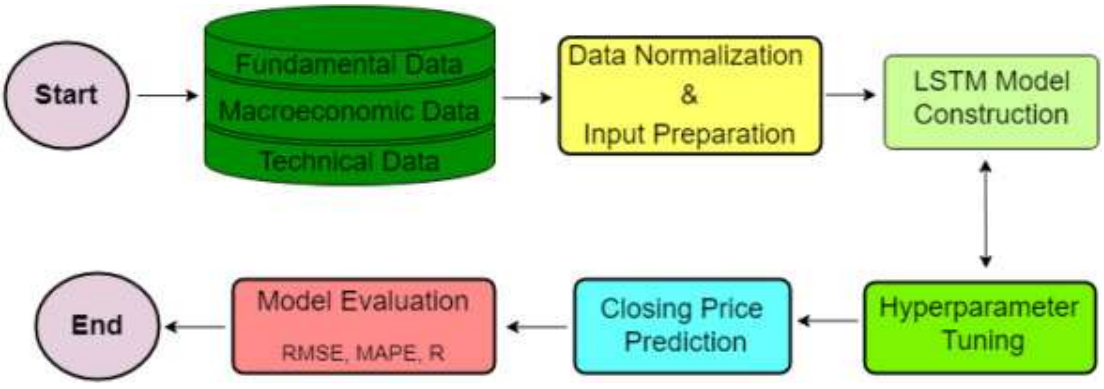
Introduction:

Gold has been the original value and medium of exchange from many centuries. Gold price prediction in India in 2021 according to the last previous rededication is Rs 60,300. By predicting gold price investors will have an idea about when to buy or sell the commodity. Gold price is directly linked to the country's currency and hence affects the stock price. It is seen that the decrease in stock price increases the gold price. This paper is mainly aiming on the early prediction model using Long Short Term Memory (LSTM) and its variance. Hence early prediction of gold price helps investors to invest or sell the gold at the best possible price.[1]

Problem Statement:

Developing a predictive model that utilizes past gold prices and other relevant data to forecast future gold prices. The LSTM model, a type of recurrent neural network, can be trained on historical gold price data to capture complex patterns and relationships in the data, and then used to make predictions on future gold prices. The goal is to create a model that can accurately predict gold prices, which can be valuable for investors, traders, and others involved in the gold market.

Block Diagram:



Methodology:

- **Data Collection:** We have collected historical gold price data and other relevant data such as daily high and lows of gold price, %volume of transaction and %change in prices.

- **Data Preprocessing:** Preprocessing the collected data by cleaning, normalizing, and transforming it into a suitable format for training the LSTM model.

- **Feature selection**: We select the most relevant features to be used as input to the LSTM model

- **Model development:** Developing an LSTM model architecture that is suitable for the problem at hand, such as the number of LSTM layers, number of neurons in each layer, activation functions, and optimization algorithms.

- **Model training:** Training the LSTM model on the preprocessed data using a suitable training algorithm such as Nadam.

- **Model evaluation:** Evaluating the performance of the LSTM model on a test dataset using suitable evaluation metrics such as mean absolute error (MAE).

- **Model deployment:** Deploying the LSTM model in a production environment to make real-time gold price predictions based on new data inputs.

- **Model monitoring**: Monitoring the performance of the deployed model and retraining it periodically to ensure that it remains accurate and up-to-date with new market trends and data.[2]

Algorithm/ Flowchart:

1. Collect a dataset of Gold prices (2013-22).

2. Preprocess the dataset by checking duplicates, missing values

3. Split the data into training and testing sets

4. Scale the data using MinMaxScalar.

5. Build a LSTM model with fully connected layers and a softmax output layer.

6. Train the LSTM model on the training dataset.

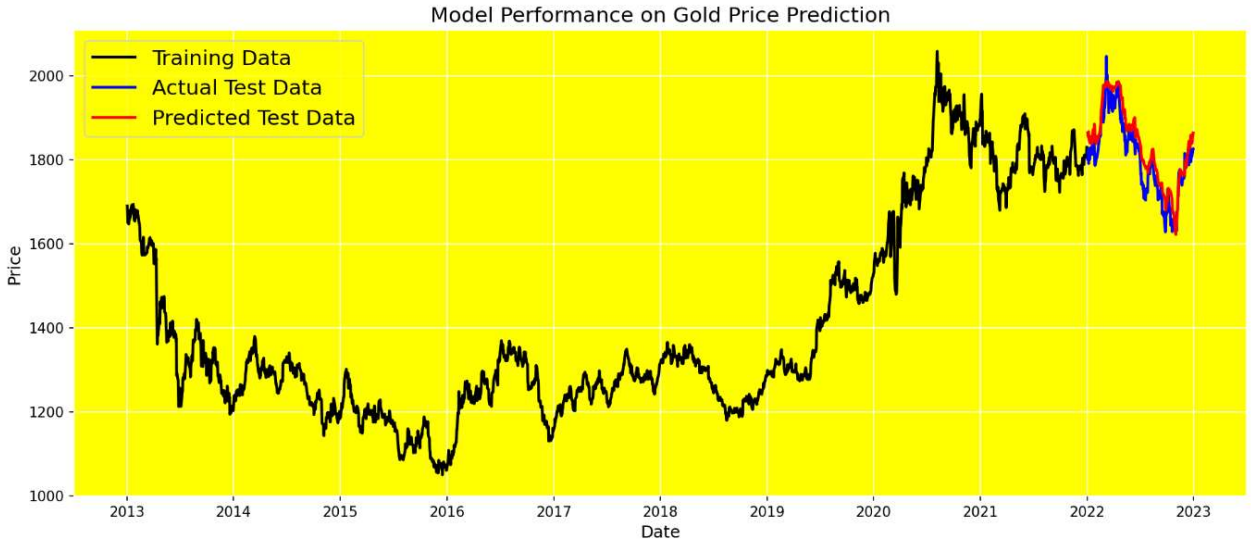
7. Evaluate the performance of the LSTM model on the testing dataset usingmetrics such as loss, accuracy.

8. Fine-tune the LSTM model by adjusting hyperparameters such as Number of nodes and hidden layes,Number of units in Dense Layer and Dropout.

9. Use the trained LSTM model to predict the Price of Gold.

Results:

1. Accuracy and loss of the model for validation data may vary with different scenarios as we train it. Loss should typically decrease and exactness should increase with each successive period.
2. Loss: 10.93%, accuracy: 96%, are the outcomes.
3. The outcomes of our project are as follows:



Conclusion:

1. In conclusion, LSTM has shown promising results in predicting gold prices, and several studies have reported high accuracy and low RMSE in their predictions. However, as with any predictive modeling approach, the accuracy of the model depends on various factors, such as the quality and quantity of data, the choice of input features, and the model architecture and hyperparameters.

2. Therefore, further research is needed to improve the accuracy of LSTM models for gold price prediction and to explore the potential of other machine learning and deep learning techniques for this task. Nonetheless, LSTM remains a valuable tool for analysts and investors who seek to forecast gold prices and make informed decisions based on those predictions.

References:

[1].https://www.researchgate.net/publication/337034776_Gold_Price_Forecast_Based_on_LSTM-CNN_Model

[2] https://iq.opengenus.org/text-summarization-using-rnn/amp/