STOCK AND CRYPTOCURRENCY PREDICTION

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Abstract: In our project, the point is to anticipate long term esteem of the money related stocks of a company and crypto coins individually with fine precision. The future prices of stock and cryptocurrency are predicted by using the past available values. “Buy low, sell high" is a good saying but it is not a good choice for making speculations. Investment is best stock or crypto currency in awful time can have bad results, while investment in best stock or cryptocurrency at right time can have best benefits. Prediction for long term values is easy as compared to day-to-day basis as prices fluctuate a lot. So, our model predicts the price of stocks and cryptocurrencies, which helps the investors to invest in appropriate stocks and cryptocoins. The dataset used is taken from yahoo finance and twelve data using web scraping. The dataset retrieved is in raw format. It consists of collection of values of stock market data of various companies, and also data of various cryptocurrencies. First, raw data is converted into processed data, which is done using feature extraction. Then the dataset is splitted into training and test sets. We use the training dataset to train the model, and use test dataset to predict the future prices of stocks and cryptocurrencies. Now user can gain best knowledge about stock price trends of various companies and also cryptocurrency price trends, and can decide on for best investments in respective fields and gain best benefits.
Keywords: Stock, Cryptocurrency, companies, good accuracy, efficient.

INTRODUCTION

Stocks are related to equity security, and represent to ownership of company. When a person owns company's shares, he becomes partial owner of company. Cryptocurrency is a digital currency, where security is provided through cryptography, thus making it very much secure. Stock and cryptocurrency prediction using machine learning helps to predict future prices of company's stock and cryptocoins.

Thus, this helps the investors and users to gain maximum profit through their investment. Our project makes use of machine learning techniques so as to disclose patterns which are not seen before, using which precise and accurate predictions of stocks and cryptocurrency can be made.

RELATED WORK

In paper [1], the methodology used is Linear Regression and SVM. Here they have used web scrapping to collect stock datasets from yahoo finance website. The collected data is then plottedon a graph to analyse the prices of various stocks like Apple, Amazon, Microsoft, Google, etc. Then we predict the price of stocks using Linear Regression and Support vector Machine, therefore it was concluded that Linear Regression was better in prediction compared to SVM. The graph is then analysed whether the price is going high or low.

In paper [2], the methodology used is Decision Tree and Regression techniques. Here they are predicting bitcoin prices. In order to forecast price of bitcoin accurately different parameters are considered that has an impact on the price of bitcoin. We use Decision Tree and Regression techniques to forecast the bitcoin prices and the accuracy of two models are compared.

In paper [3], the methodology used is Bayesian Regression model. When conducting analysis of bitcoin price forecasting, it is influenced by many factors such as supply and demand, volume of transactions, financial indicators, technical indicators such as the number of blocks created and difficulty. The major impact on cryptocurrency price here is that the trends in social networks and search engines. Therefore, considering these factors a regression model can be created for forecasting the cryptocurrency prices.

In paper [4], here two models are used Linear Regression and Decision Tree Regression which are applied to different sizes of datasets to analyse forecasted stock prices accurately. Here the prediction is on stock market prices, so classification algorithms like linear regression and decision tree regression are used. Therefore, the main goal was to get better decision using the classification algorithms and with the help of statistic formula better stock prediction can be obtained.

EXISTING SYSTEM

In stock and cryptocurrency analysis, the stock's and cryptocurrency's past performance, identifying patterns in stock and cryptocurrency price variation, is one of the traditional approaches to stock and cryptocurrency price prediction. By making use of simple Artificial Neural Networks algorithms, it fails to capture long-term temporal dependencies in stock and cryptocurrency values. Another important concern when utilising basic Artificial Neural Networks algorithms for stocks and cryptocurrencies prediction is the exploding gradient phenomenon, which occurs when the weights of a complex large network become either too large or too small, thereby reducing their convergence to the ideal value. Which is usually caused by two factors that is, weights are randomly initialized, and the weights closer to the end of the large complex network also change more than those at the beginning of the network. Another method is to minimize the size of the input dataset and with the help of feature selection algorithms, we can shortlist the main setoff features which as greater impact on the prices of various stocks and cryptocurrencies. This method does not consider the entire history of trends and long term trading strategies that are being used.

PROPOSED SYSTEM

In the developed system, we are predicting future stock values of various companies around the world as well as future cryptocurrency prices. By fetching data through web scraping and using LSTM model for predictions. Later we either display or plot the forecasted prices for stock and cryptocurrency.

SYSTEM ARCHITECTURE

Here, the dataset is been taken from yahoo finance and twelve data website using web scraping. But the format of dataset is raw.

A. MODULE DESCRIPTION - Collecting data from user:

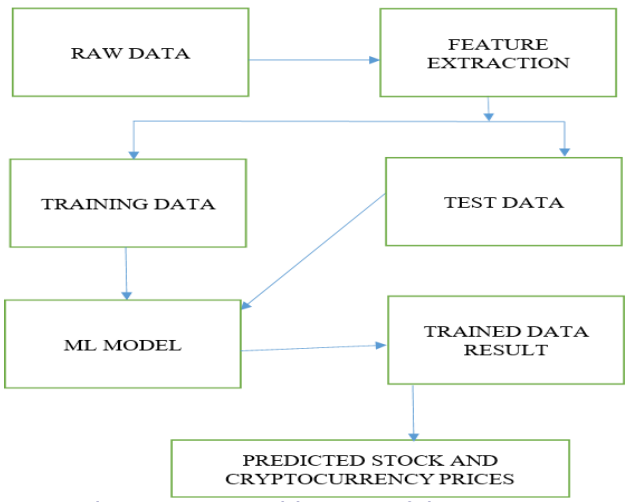


Fig. 1. System Architecture of the system.

First step is to convert raw data into three-dimensional array with the help of reshape function. Then, the data is split into two parts that is train and test data. We use the train dataset to train the model, and then feed test dataset into the model and predict future price of stock and cryptocurrency. Then using predicted values, we plot the graph and display the price. For stocks, search bar is provided in the website to enter the company symbol were, prediction is done for a company based on what is entered in the search bar. For cryptocurrency,search bar is provided in the website to enter the cryptocurrency symbol were, prediction is done for a cryptocurrency based on what is entered in the search bar.

Data Retrieval and Data Preprocessing:

For stocks, data is retrieved using web scraping from yahoo finance using Pandas Data Reader library. In preprocessing of the data, we retrieve close column from the dataframe and scale it between 0 to 1 using MinMax Scaler from sklearn library. For cryptocurrency, data is retrieved from a URL in is on format using the apikey provided by twelve data website. Later we convert it to a dataframe and retrieve the close column and scale it between 0 to1.

Splitting the data into training and test sets: For stocks, basically available 10 years of data is splitted into 65% training and 35% testing sets using the length of the dataframe. Both sets are reshaped into 3 dimensional arrays. For cryptocurrency, data retrieved from the twelve data website is splitted into 17days for the training set and 3 days for the testing set. Both sets are reshaped into 3 dimensional arrays.

Building Model: For stocks, LSTM model is built using 3 LSTM layers and a dense layer from kerasapi. In our analysis, we consider the mean square error loss and adam optimizer. For cryptocurrency, LSTM model is built using 3layers of LSTM and a dense layer from kerasapi. Here, the first layer as dropout of 40%, second layer as 20% and the third layer as 10%. As previously we consider the mean square error loss and adam optimizer.

Prediction: For stocks, the predicted series of values by machine learning model are displayed in visual representation using mat plot lib library in the form of line plot graph. For cryptocurrency, the predicted value by machine learning model is displayed.

RESULTS

Successfully predicting stock and cryptocurrency prices with fine accuracy.

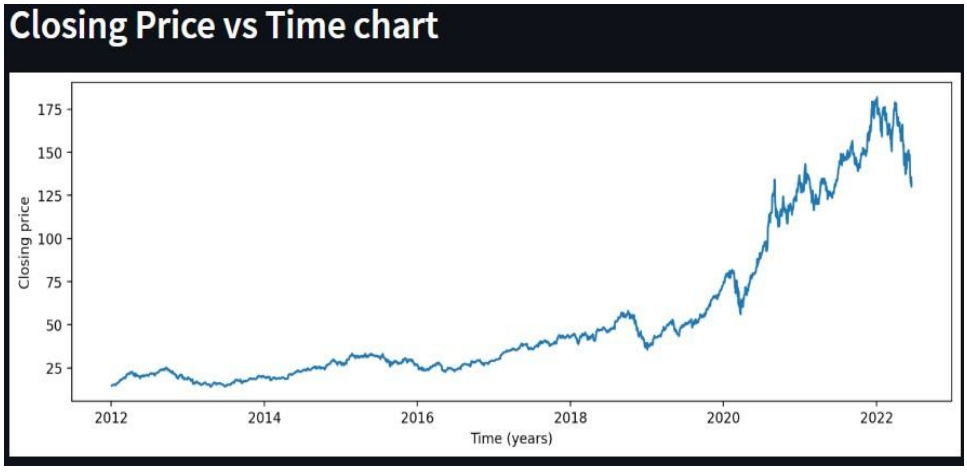
A. For Stocks:

Data retrieved from yahoo finance is displayed in the website as a data frame using pandas data reader's describe function.

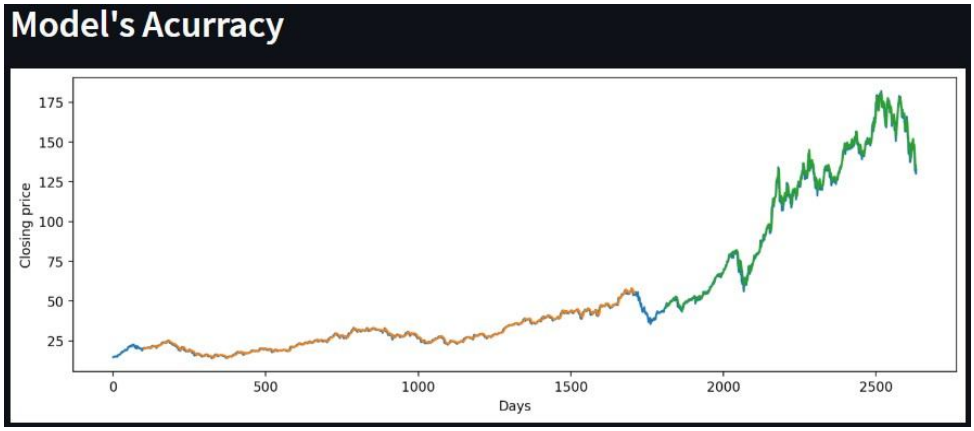
Data Statistics Available

	High	Low	Open	Close	Volume	Adj Close
count	2,633.0000	2,633.0000	2,633.0000	2,633.0000	2,633.0000	2,633.0000
mean	54.5530	53.3852	53.9654	53.9893	209,795,768.1576	52.1735
std	44.9468	43.8226	44.3821	44.4044	173,769,815.3214	45.0221
min	14.2714	13.7536	13.8561	13.9475	22,544,659.0000	12.1014
25%	24.1250	23.6525	23.8725	23.8875	99,600,400.0000	21.6134
50%	35.5000	35.1125	35.3525	35.3000	145,658,400.0000	33.2799
75%	62.3125	60.3025	61.6250	61.2325	257,666,000.0000	60.3139
max	182.9400	179.1200	182.6300	182.0100	1,506,120,000.0000	181.5117

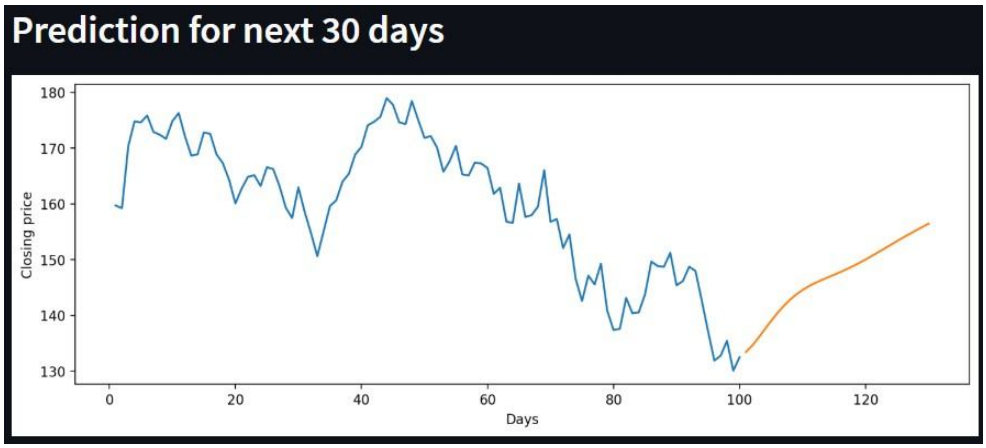
Line graph based on closing price vs time in years.



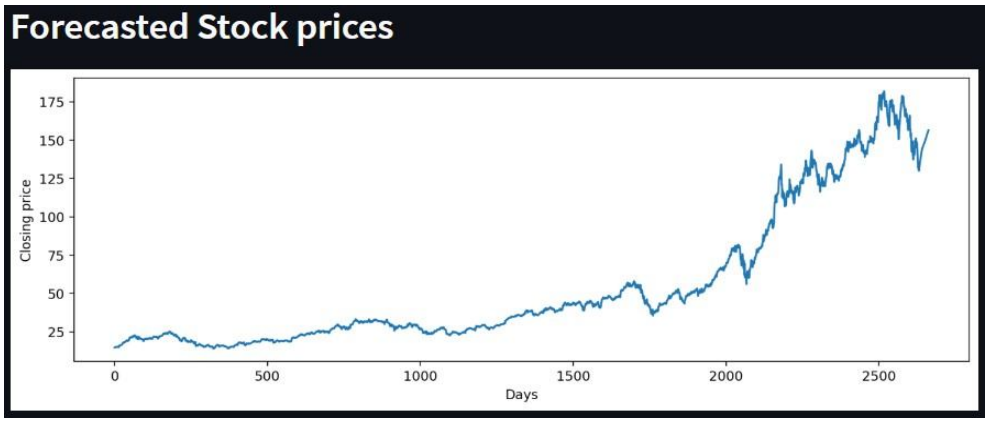
LSTM'S model accuracy in form of line graph representing both training and testing set.



Line graph representing prediction of a stock for the next 30 days.

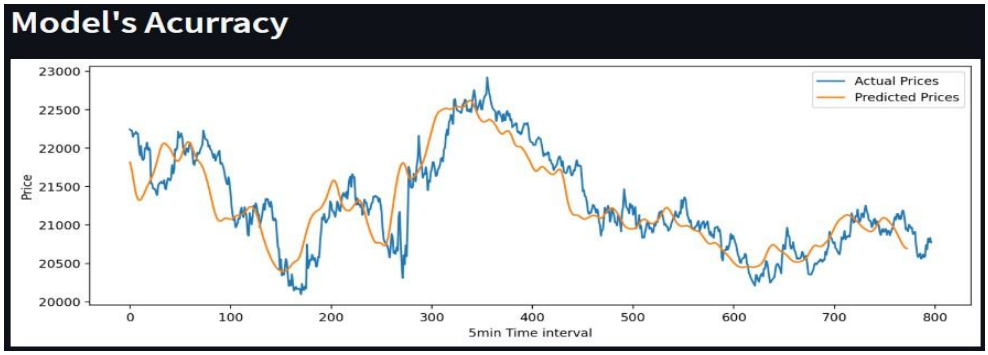


Line graph representing original closing price along with forecasted future prices.

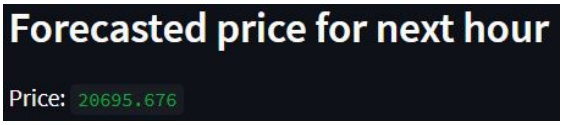


A. For Crypto currency:

LSTM'S model accuracy in form of line gragh representing testing set in a 5min time interval for the cryptocurrency searched.



Forecasted price for next hour for the cryptocurrency searched.



FURTURE ENHANCEMENTS:

Providing a user interface walk through guide and improving the user interface. Enabling user interaction using voice-based commands for blind and visually impaired people. Providing are commendation system for investors.

CONCLUSION:

For stock prediction data is retrieved from yahoo finance and fed into the LSTM model where it is trained and tested and even predicting the future price for given period of days. For cryptocurrency data is retrieved from twelve data website in is on format and converted into data frame and fed into the LSTM model. The future price for upcoming hour is also predicted. The website was developed using python Streamlit framework for stock and cryptocurrency prediction. From this project it is concluded that the prediction of stock and cryptocurrency prices using RNN LSTM model provides best accuracy then other models.

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