Stock Price Value Prediction of a Company

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Abstract - *Stock market is one of the most crucial sectors of a rustic's financial system. Prediction of stock expenses isn't always clean because it isn't desk bound in nature. Accurate prediction of stock marketplace returns is a very hard project due to risky and non-linear nature of the financial stock marketplace. Inventory marketplace prediction is the act of seeking to decide the destiny value of a organization inventory or different monetary instrument traded on a economic alternate. The successful prediction of a stock's future charge will maximize investor's gains. The recent success of the software of artificial intelligence inside the monetary quarter has resulted in more corporations relying on stochastic models for predicting the conduct of the market. Stock marketplace prediction has lengthy been a primary studies topic that exploits various system studying strategies and various sets of statistics. Most current works utilize more than one inventory ancient facts in addition to updated information of relevant elements which could have impacted the stock charge fee which include oil charge, gold fee, and many others. Very few works discover the possibility of incorporating monetary information when predicting the inventory rate course.*

So we proposed a machine with the help of gadget gaining knowledge of techniques and lstm (lengthy short term memory) set of rules to expect stock charge based totally on preceding inventory statistics.

1. INTRODUCTION

Inventory marketplace is characterized as dynamic, unpredictable and non-linear in nature. Predicting stock charges is a tough undertaking as it relies upon on different factors consisting of however not restrained to political situations, international economic system, organisation's financial reports and overall performance etc. Consequently, to maximize the income and limit the losses, strategies to are expecting values of the stock in advance via studying the trend over the last few years, could prove to be notably beneficial for making stock market actions . Traditionally, essential procedures were proposed for predicting the inventory fee of an employer. Technical evaluation technique uses historical rate of shares like closing and starting rate, quantity traded, adjoining close values and many others. Of the inventory for predicting the destiny rate of the inventory. The second sort of evaluation is qualitative, which is done on the idea of external elements like corporation profile, market state of affairs, political and monetary factors, textual records within the shape of financial new articles, social media and even blogs by monetary analyst. Inventory marketplace is an aggregation stockbrokers and traders who can purchase and sell stocks of stocks. Many massive corporations have their shares listed on a inventory market. This makes the stock liquid and for that reason more appealing to the traders. There's a huge wide variety of traders who invest handsome amounts in a stock marketplace. But, it involves chance due to the fact charges of inventory may additionally upward thrust or fall within no time. That is why predicting inventory expenses isn't always an clean challenge and plenty of researchers are operating on it. Stock market prediction systems have long been an critical tool for inventory traders. Normally, the stock movement course is laid low with many elements, e.G., gold charge, oil charge, vital activities, and ultimate but now not least information associated with agencies inside the stock markets. Whilst most elements taken into consideration in inventory marketplace prediction algorithms are quantitative values, substantial quantity of researchers has used monetary news for you to gain better accuracy in predicting future direction of a stock. Prediction of price moves within the stock market is usually believed to be a totally difficult undertaking. A well known hypothesis amongst teachers, the green market hypothesis , shows that costs immediately mirror all the available information and the handiest issue that causes security fees to trade is new records. Therefore, as the arrival of new information is unpredictable, prices within the marketplace appear to be randomly generated.

So we proposed a device with the assist of system learning strategies and lstm (long short term memory) set of rules to expect inventory fee primarily based on preceding inventory data.

2. Literature survey

- **P. K. Bharne and S. S. Prabhune :** This paper presents the basic idea and principles of swarm intelligence and its applicability for daily stock market price optimization. Also, presents the basic algorithms of swarm intelligence including ACO, PSO, BAT, Firefly etc. From the survey, they conclude that the SI-ANN produce more optimized results that the SI with machine learning algorithms.They presented the comparative analysis of recent SI based approaches along with some future trends.

- **Mehar Vijha , Deeksha Chandolab, Vinay Anand Tikkiwalb, Arun Kumarc :** The historical dataset available on company's website consists of only few features like high, low, open, close, adjacent close value of stock prices, volume of shares traded etc., which are not sufficient enough. To obtain higher accuracy in the predicted price value new variables have been created using the existing variables. ANN is used for predicting the next day closing price of the stock and for a comparative analysis, RF is also implemented. The comparative analysis based on RMSE, MAPE and MBE values clearly indicate that ANN gives better prediction of stock prices as compared to RF.

- **Hegazy, Osman & Soliman, Omar S :** This paper, proposed a machine learning model that integrates particle swarm optimization (PSO) algorithm and LS-SVM for stock price prediction using financial technical indicators. These indicators include relative strength index, money flow index, exponential moving average, stochastic oscillator and moving average convergence/divergence The PSO is employed iteratively as global optimization algorithm to optimize LS-SVM for stock price prediction. LS-SVM-PSO achieves the lowest error value followed by single LS-SVM, while ANN-BP algorithm is the worst one.

3. METHADOLOGY

A Stock Price Dataset is taken. The dataset is loaded and preprocessed with various machine learning techniques. The preprocessed data is divided as training and testing data. The prediction model is built using machine learning algorithm LSTM (Long Short Term Memory). The model is trained using training dataset and once the model has been trained successfully it has to be tested. The trained model is tested using testing dataset. The finalized model is converted into h5 (Hierarchical Data Format 5) and saved. A Front End is developed with the help of Flask and HTML. Now user will enter the input that is which date stock price to predict in the front end. The collected date from the front end is given as input to our finalized algorithm to predict stock price of that date. Finally the predicted output is displayed on the front end.

4. PACKAGE REQUIRED

Numpy:

NumPy is the fundamental package for scientific computing in Python.NumPy is a Python package that stands for 'Numerical Python' which contains a powerful n-dimensional array object.It is used in the industry for array computing.NumPy aims to provide an array object that is up to 50x faster that traditional Python lists.

Pandas :

Pandas is a Python package that provides fast, flexible, and expressive data structures. Pandas is a fast, powerful, flexible and easy to use open source data analysis and manipulation tool, built on top of the Python programming language. It aims to be the fundamental high-level building block for doing practical, real world data analysis in Python.

Sklearn:

scikit-examine (sklearn) is the most useful and robust library for system mastering in python. It offers a diffusion of green tools for machine getting to know and statistical modelling. It includes category, regression, clustering and dimensionality reduction through a consistence interface in python. This library, which is essentially written in python, is constructed upon numpy, scipy and matplotlib.

Matplotlib:

matplotlib is a complete plotting library for developing static, animated, and interactive visualizations in python. matplotlib makes use of an item oriented api to embed plots in python applications. The library is widespread and able to changing very minute info of a parent. It's miles used to create awesome graphs, charts, and figures and so on. matplotlib is a multi-platform information visualization library constructed on numpy arrays and designed to work with the wider scipy stack. matplotlib consists of several plots like line, bar, scatter, histogram and many others. matplotlib comes with a huge kind of plots which facilitates to recognize developments, styles, and to make correlations. matplotlib is beneficial for developing static second plots, the type of plots included in medical guides and displays.

Keras:

keras is a deep getting to know api written in python, going for walks on top of the machine mastering platform tensorflow. It changed into evolved with a focal point on allowing rapid experimentation. it is a distinctly-effective interface for fixing machine studying troubles, with a focal point on contemporary deep learning. This api was "designed for human beings, not machines.

5. IMPLEMENTATON

Python:
Python is an interpreted, item-oriented, high-stage programming language with dynamic semantics. Its high-degree constructed in data structures, mixed with dynamic typing and dynamic binding, make it very attractive for rapid utility development, as well as to be used as a scripting

language. Python's easy, easy to research syntax emphasizes readability and therefore reduces the price of program maintenance. Python supports modules and programs, which encourages program modularity and code reuse. The python interpreter and the significant widespread library are to be had as open source. Python is broadly considered as the preferred language for teaching and mastering ml (machine gaining knowledge of).

Capabilities :
- smooth to code
- free and open source
- item-oriented language
- excessive-degree language
- extensible characteristic
- python is portable language
- python is included language
- interpreted language
- huge widespread library
- dynamically typed language

HTML:

HTML (**H**yper**t**ext **M**arkup **L**anguage) is the code that is used to structure a web page and its content. For example, content could be structured within a set of paragraphs, a list of bulleted points, or using images and data tables.

Xampp control panel :

Xampp is the title used for a compilation of unfastened software program. The call is an acronym, with every letter representing one of the 5 key additives. The software packet carries the net server apache, the relational database control gadget mysql (or mariadb), and the scripting languages perl and personal home page. The initial x stands for the working systems that it works with: linux, home windows, and mac os x.

Apache: The open supply web server apache is the maximum extensively used server worldwide for delivery of web content material. The server software is made to be had as a loose software program by the apache software basis.

mysql/mariadb: in mysql, xampp consists of one of the maximum famous relational database management structures inside the global. In mixture with the internet server apache and the scripting language personal home page, mysql gives information storage for net offerings. Contemporary xampp variations have replaced mysql with mariadb (a network-advanced fork of the mysql venture, made by the original builders).

Hypertext Preprocessor: the server-side programming language Hypertext Preprocessor permits customers to create dynamic websites or packages. Personal home page can be installed on all systems and supports some of diverse database systems.

perl: the scripting language perl is used in system management, web improvement, and network programming. Like Hypertext Preprocessor, perl also enables users to program dynamic web programs.

Along these center components, this loose-to-use apache distribution contains a few other useful tools, which range relying in your running gadget. Those gear consist of the mail server mercury, the database management device phpmyadmin, the net analytics software program answers webalizer, openssl, and apache tomcat, and the ftp servers filezilla or proftpd.

Software areas

An xampp server may be installed and used with a unmarried executable document quickly and without problems, functioning as a neighborhood test system for linux, windows, and mac os x. The software packet incorporates the equal additives which can be found on common net servers. Developers have the danger to test out their tasks regionally and to transfer them easily to effective structures. But xampp isn't suitable to use as a public server, due to the fact many safety capabilities were deliberately neglected to simplify and accelerate the system for trying out.

Flask:

Flask (supply code) is a python internet framework constructed with a small middle and clean-to-amplify philosophy. Flask is taken into consideration more pythonic than the django net framework because in not unusual conditions the equivalent flask net application is extra specific. Flask is also smooth to get started out with as a beginner due to the fact there's little boilerplate code for purchasing a simple app up and going for walks. Flask is a famous python internet framework, meaning it's miles a 3rd-celebration python library used for developing net packages.

6. ALGORITHM USED

LSTM (Long Short Term Memory)

Long Short Term Memory Network is an advanced RNN, a sequential network , that allows information to persist. It is capable of handling the vanishing gradient problem faced by RNN. A recurrent neural network is also known as RNN is used for persistent memory.

Let's say while watching a video you remember the previous scene or while reading a book you know what happened in the earlier chapter. Similarly RNNs work, they remember the previous information and use it for processing the current input. The shortcoming of RNN is, they can't remember Long term dependencies due to vanishing gradient. LSTMs are explicitly designed to avoid long-term dependency problems.
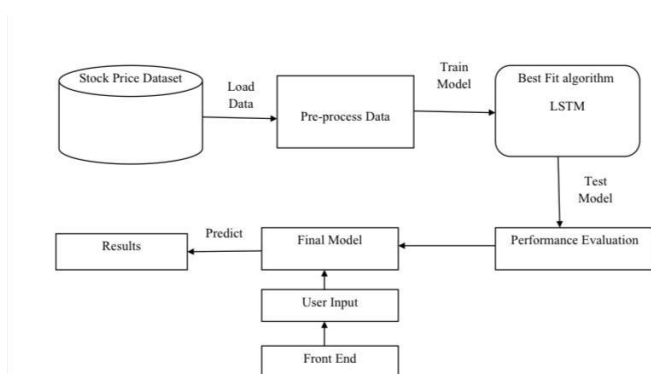
7. SYSTEM ARCHITECTURE
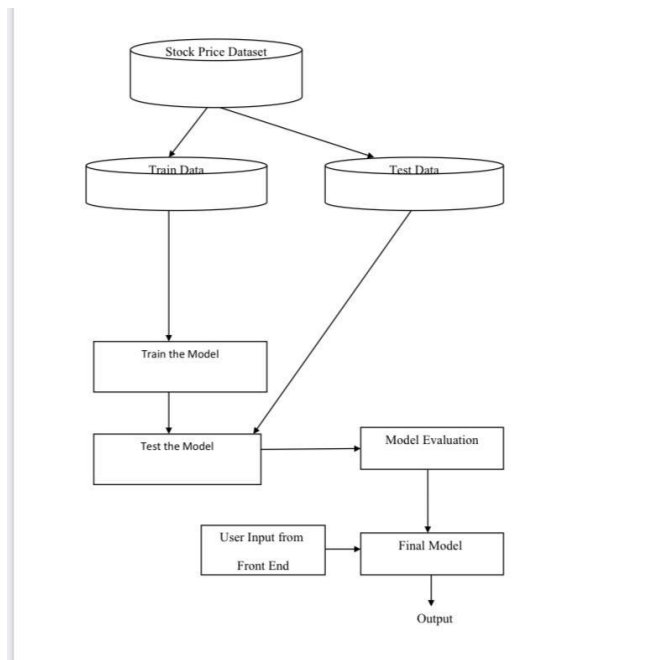
Stock Price dataset is taken and loaded. The data is preprocessed to clean the data and understand the dataset. The data is split as training and testing data.

The model is built using machine learning algorithm LSTM (Long Short Term Memory). The model is trained with the preprocessed data. The model is tested. The final model will predict stock price based on user given new data from front end.

8. DATAFLOW DIAGRAM

Stock Price dataset is taken and loaded. The data is preprocessed to clean the data and understand the dataset. The data is split as training and testing data. The model is built using machine learning algorithm LSTM (Long Short Term Memory). The model is trained with

the preprocessed data. The model is tested. The final model will predict stock price based on user given new data from front end.

9. CONCLUSIONS

In the finance world inventory trading is one of the most necessary activities. Stock market prediction is an act of attempting to decide the future price of a stock other monetary instrument traded on a financial exchange. The technical and integral or the time sequence evaluation is used with the aid of most of the stockbrokers while making the inventory predictions. Stock price prediction is still a challenging task due to its natural dynamic and real-time movement. Thus, predicting stock prices are deemed unseeingly. Several techniques are devised in the existing techniques to predict the stock market trends. We proposed a system to predict stock price accurately using machine learning. We used neural networks model to predict the value of stock share in the next day using the previous data about stock market value.

We implemented our proposed system using LSTM (Long Short Term Memory) a RNN (Recurrent Neural Network) algorithm using new stock price dataset and our model is predicting stock price value more efficiently.

10. REFERENCES

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