Title: Stock price prediction

IBM phase - 3

Abstract

Researchers have been studying different methods to effectively predict the stock market price. Useful prediction systems allow traders to get better insights about data such as: future trends. Also, investors have a major benefit since the analysis give future conditions of the market. One such method is to use machine learning algorithms for forecasting. This project’s objective is to improve the quality of output of stock market predicted by using stock value. A number of researchers have come up with various ways to solve this problem, mainly there are traditional methods so far, such as artificial neural network is a way to get hidden patterns and classify the data which is used in predicting stock market. This project proposes a different method for prognosing stock market prices. It does not fit the data to a specific model; rather we are identifying the latent dynamics existing in the data using machine learning architectures. In this work we use Machine learning architectures Long Short-Term Memory (LSTM), Convolutional Neural Network (CNN) and Hybrid approach of LSTM + CNN for the price forecasting of NSE listed companies and differentiating their performance. On a long-term basis, sling window approach has been applied and the performance was assessed by using root mean square error

**Introduction**

Stock Price Prediction:

Due to the high profit of the stock market, it is one of the most popular investments. People investigated for methods and tools that would increase their gains while minimizing the risk, as the level of trading and investing grew. Two stock exchanges namely- the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE), which are the most of the trading in Indian Stock Market takes place. Sensex and Nifty are the two prominent Indian Market Indexes. Since the prices in the stock market are dynamic, the stock market prediction is complicated. From gradually the very past years some forecasting models are developed for this kind of purpose and they had been applied to money market prediction. Generally, this classification is done by: 1. Time series analysis 2. Fundamental analysis 3. Technical analysis Time Series Analysis The definition of forecasting can be like this the valuation of some upcoming result or results by analysing the past data. It extents different areas like industry and business, economics and finance, environmental science. Forecasting problems can be classified as follows:  Long term forecasting (estimation beyond 2 years)  Medium-term forecasting (estimation for 1 to 2 years)  Short term forecasting (estimation for weeks or months, days, minutes, few seconds) The analysis [1] of time consist of several forecasting problems. The designation of a time series is a linear classification of observations for a selected variable. The variable of the stock price in our case. Which can weather multivariate or univariate? Only particular stock is included in the univariate data while more than one company for various instances of time is added in multivariate. For investigating trends, patterns and cycle or periods the analysis of time series advantages in the present data. In spending money wisely an early data of the bullish or bearish in the case of the stock market. Also, for categorizing the best-performing companies the analysis of patterns plays its role for a specific period. This makes forecasting as well as time series analysis an important research area.

Applications

* Business
* Companies
* Insurance company
* Government Agency

This application is helpful for stock investors, sellers, buyers, brokers.

Objectives

A stock market prediction is described as an action of attempting to classify the future value of the company stock or other financial investment traded on the stock exchange. The forthcoming price of a stock of the successful estimation is called the Yield significant profit. This helps you to invest wisely for making good profits. The future price of a stock is the main motivation behind the stock price prediction. In various cases like business and industry, environmental science, finance and economics motivation can be useful. The future value of the company’s stock can be determining.

Conclusion

The importance of the stock market to a country's economy will make the types of stock price forecasting methods continue to develop and grow, and will continue to be derived from the development of other disciplines. In the development process of the follow-up forecasting method, it is necessary to continuously explore and deeply study the characteristics of the stock market, so as to make the model closer to reality, expand the applicability of the method, and obtain better forecasting accuracy. Because stock data is affected by economic factors, political factors or environmental factors, the law of its change is elusive, and the cycle of the law of change is difficult to determine. Therefore, the model still needs a lot of historical data and selection of appropriate variables for analysis to obtain the desired results. In the traditional ARIMA model, when analysing complex stock markets, its prediction results are not particularly ideal, and there are still certain errors in price prediction. As a technology in the field of deep learning, neural network can solve non-linear problems well. LSTM neural network is optimized on traditional neural network and introduces the concept of "gate", which enhances the long-term memory ability of the model, which enhances its generalization ability. Therefore, the application of LSTM neural network in analysing financial-related time series data is promising. Based on the understanding of traditional time series analysis and RNN and LSTM neural network, this paper constructs a stock price prediction model based on LSTM neural network. For better comparison, we also established a traditional ARIMA model for comparison. As the neural network has a good predictive effect on nonlinear problems, this article chooses the optimized neural network-LSTM model, and also chooses the use of single-feature and multi-feature input models to seek better prediction results. The traditional time series model focuses on the role of time in stock forecasting

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