Build My Money: Machine Learning Based StockAdvisor

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Abstract:- Predicting stock prices is a complex task that has garnered significant attention from the machine learning community in recent years. Although the stock market is inherently unpredictable, researchers have find out various techniques to predict stockss price with varying degrees of success.

In this particular study, our goal is to predict stock price over a short-term period using candlestick charts. Candlestick chart are a popular component of technical analysis, which provides a quick and easy way to interpret an asset's price movements. By analyzing the patterns formed by candlesticks, traders can often predict future direction of prices with a reasonable degree of accuracy.

To build our predictive model, we decided to use an LSTM model. LSTM, an acronym for long short-term memory, refers to a specific kind of recurrent neural network (RNN) that is adept at processing data sequences with a temporal nature.. LSTM models are particularly well-suited for time-series forecasting tasks because they can handle both short-term dependencies and long-term dependencies.

In our study, we plan to fetch historical data for the stock we are interested in using Python libraries. Once we have the data, we will train the LSTM model helps the data to predict future prices of the stock. By using candlestick charts in combination with the LSTM model, we hope to achieve a high degree of accuracy in our stock price predictions.

Overall, this study aims to demonstrate the effectiveness of using candlestick charts and LSTM models in predicting stock prices. By doing so, we hope to contribute to the growing body of research on stock price prediction and potentially provide insights that can help traders and investors make better decisions in stock market.

I. INTRODUCTION

The COVID-19 pandemic has caused significant disruption to the global economy, leaving many people without jobs or struggling to make ends meet. As a result, an increasing number of people have turned to stock market as a potential source of income. However, investing in stock market can be a challenging and risky venture, particularly for new traders and investors.

The big challenges faced investors is the difficulty of predicting stock market trends and identifying profitable investments. While financial advisors and analysts can provide guidance on investment strategies, they are often expensive and may not be accessible to everyone.

To address this issue, a team of developers has created an ML-based stock advisor called BuildMyMoney. The platform leverages machine learning algorithms to analyze historical market data and identify trends that may influence future stock prices. This allows users to receive personalized investment advice based on their investment goals and risk tolerance.

BuildMyMoney's take into account a wide range of factors, such as market volatility, news sentiment, and company financials, to provide users with tailored investment recommendations. By using this technology, investors can access insights that are typically only available to seasoned financial professionals, making it an appealing option for both new and experienced traders.

The platform also offers features that allow users to track their investments and monitor their portfolio performance. This

can help investors make more informed decisions and stay up-to-date with market trends.

BuildMyMoney's ML-based approach has the potential to revolutionize the way investors approach the stock market. By providing personalized investment advice and leveraging the latest in machine learning technology, BuildMyMoney aims to help investors achieve greater success in their investment endeavors. While investing in stock market will always carry a degree of risk, tools like BuildMyMoney can help mitigate that risk and provide a more reliable path to financial success.

➢ ABOUT CANDLESTICK

Candlestick charts is a popular type of financial chart used in technical analysis to display price movements of an asset over a specific time period. Each individual candlestick on the chart represents a particular time interval, such as a day, an hour, or even a minute.

Each candlestick consists of three basic features: the body, the wick, and the color. The body of the candlestick represents the open-to-close range for the time period being analyzed. If the closing price is higher than the opening price, the body of the candlestick will typically be green or white. If the closing price is lower than the opening price, the body will typically be red or black.

The wick or shadow of the candlestick represents the intra-day high and low prices of the asset. The top represents the highest price the asset reached during the time period, while the bottom represents the lowest price.

Candlestick charts are particularly useful for identifying patterns and trends in the market, as well as key support and resistance levels. For example, a common candlestick pattern is the "doji", which occurs when the opening and closing prices are very close to each other, resulting in a small body and long wicks. A doji can indicate a potential reversal in the market, as it suggests that the buying and selling pressures are roughly equal.

Other candlestick patterns include the "hammer", the "hanging man", and the "engulfing pattern", among others. These patterns can help traders identify potential entry and exit points for their trades, as well as provide insight into market sentiment and momentum.

Overall, candlestick charts are an essential tool for traders and investors who rely on technical analysis to guide their investment decisions. By providing a clear and visual representation of price movements, candlestick charts help traders identify patterns and trends in the market, and make informed decisions about their investments.
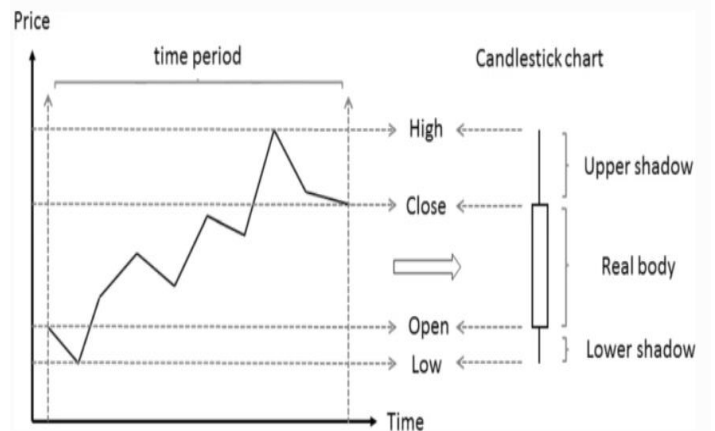
Fig 1. Building of Candlestick using line graph

➢ SUPPORT AND RESISTANCE LEVELS:

These levels is key concepts in technical analysis that traders use to identify potential buying and selling opportunities in the market. These levels are based on past price movements and represent points where the price of an asset has historically found either support or resistance.

Support is a price level where demand for an asset is strong enough to prevent the price from falling further. This is because buyers are willing to enter the market at this price, creating upward pressure on the asset's price. Traders identify support levels by looking for areas where the price has bounced back up after reaching a certain level multiple times in the past. Once a support level has been established, traders often set their buy orders slightly above that level in anticipation of a rebound.

Resistance, is a price level where the supply of asset is strong to prevent the price rising further. This is because sellers are willing to enter the market at this price, creating downward pressure on the asset's price. Traders identify resistance levels for areas where the price has failed to break through a certain level multiple times in the past. Once a resistance level has been established, traders often set their sell orders slightly below that level in anticipation of a pullback.

Support and resistance levels can be identified by looking at charts of past price movements. Traders typically use line charts or candlestick charts to identify these levels. A line chart shows the closing price of an asset over a period of time, while a candlestick chart shows the open, high, low, and close prices of an asset for a given period.

Support and resistance levels are important because they represent areas where the balance of supply and demand has shifted in the past. When an asset's price reaches a support or resistance level, traders are paying attention because they know that price has reacted to these levels before.

When an asset's price reaches a support or resistance level, traders are looking for signs of a reversal. If the price bounces

off a support level, traders will look for confirmation that the price is moving up before they enter a long position. If the price breaks through a resistance level, traders will look for confirmation that the price is moving down before they enter a short position.

Support and resistance levels can be used in combination with other technical indicators approaching a well-established support level and a bullish technical indicator such as a moving average crossover or a bullish divergence is observed, traders may consider entering a long position. Conversely, if the price of an asset is approaching a well-established resistance level and a bearish technical indicator such as a bearish divergence or a reversal pattern is observed, traders may consider entering a short position.

In conclusion, support and resistance levels are key concepts in technical analysis that traders use to identify potential buying and selling opportunities in the market. These levels are based on past price movements and represent areas where the balance of supply and demand has shifted in the past. Traders use a variety of tools to identify support and resistance levels, and they look for signs of a reversal when an asset's price reaches these levels.

➤ *Figures for Support & Resistance*

Fig 2. Support for candles

Fig 3. Resistance for candles

II. EXISTING SYSTEM

In the existing system, a human analyst is responsible for manually analyzing market data, creating charts, and identifying trends and patterns to make informed investment decisions. This process is highly dependent on the expertise of the individual analyst, which can lead to inconsistencies and inaccuracies in analysis.

Moreover, the existing system lacks the ability to provide real-time analysis and recommendations to investors. This can be a significant disadvantage in fast-moving markets where even a slight delay can result in missed opportunities or poor investment decisions. Additionally, the existing system can only handle a limited amount of data, which can limit the scope and accuracy of its analysis.

Mistakes and losses can occur in the existing traditional manual approach to stock market analysis due to the following factors:

1. Human Error: The traditional manual approach heavily relies on human analysts who are prone to making errors, which can result in incorrect analysis and recommendations.
2. Limited Data Handling Capacity: The traditional manual approach can only handle a limited amount of data due to the limitations of human cognitive capacity. This can result in missed opportunities or inaccurate analysis due to insufficient data.
3. Inability to Provide Real-Time Analysis: The traditional manual approach is time-consuming and lacks the ability to provide real-time analysis and recommendations. This can result in missed opportunities or poor decision-making due to delayed information.
4. Lack of Automation: The traditional manual approach is time-consuming and can result in delayed decision-making. It lacks the ability to automate routine tasks and free up analysts' time to focus on more strategic activities.
5. Bias and Subjectivity: The traditional manual approach is subjective and can be influenced by the analyst's biases and personal opinions. This can result in inaccurate analysis and recommendations.

In summary, the existing system is a traditional manual approach to stock market analysis that relies heavily on the expertise of the human analyst. It lacks the ability to provide real-time analysis and recommendations and can only handle a limited amount of data. An automated system that utilizes advanced technologies can provide significant improvements in terms of accuracy, reliability, and the ability to handle large volumes of data.

➢ *PROPOSED SYSTEM*

Below are the following steps that indicates the working of the system

1. **Collecting data from an official site:** The first step in the process is to gather data from an official website. This data can include stock prices, trading volumes, and other related information that is relevant to the investment decision-making process. It is important to ensure that the data is collected from a reliable and trustworthy source to ensure accuracy.

2. **Building a Candlesticks price chart:** Once the data has been collected, the next step is to build a Candlesticks price chart. A Candlesticks chart is a popular tool used in technical analysis to track and analyze stock prices over a period of time. It displays the opening and closing prices as well as the high and low prices of a stock during a specific period of time. The Candlesticks chart can be used to identify trends, patterns, and potential buy and sell signals.

3. **Plotting Support & Resistance levels**: After creating the Candlesticks chart, the next step is to plot the Support and Resistance levels on the chart. Support levels are price points where the stock price tends to stop falling and start rising, while Resistance levels are price points where the stock price tends to stop rising and start falling. These levels can be used by investors to make informed decisions about when to buy or sell a stock. Once these levels have been plotted, they can be displayed to the client side for easy access and analysis.

4. **Generating signal:** Based on conditions as shown in below Fig. 4.1. we will generate a particular signal for our users(investors).
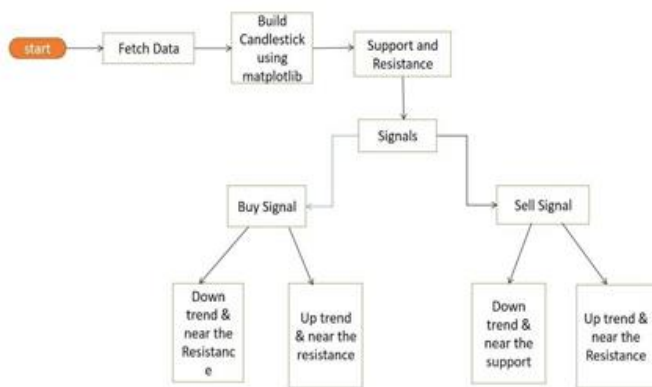

FIG 4. BLOCK DIAGRAM OF PROPOSED SYSTEM
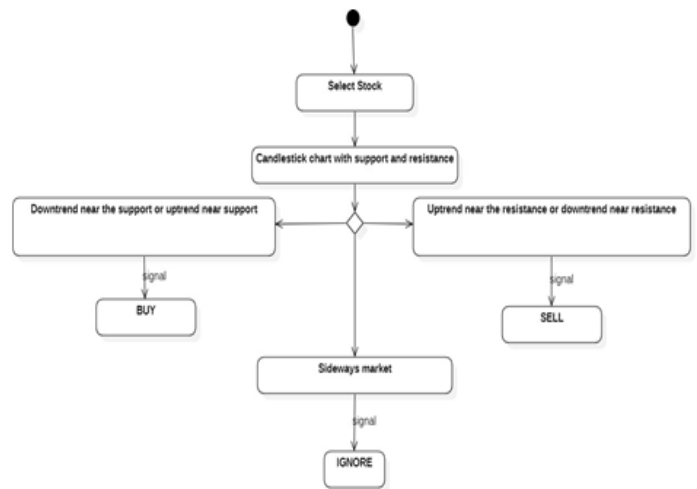
III. ACTIVITY DIAGRAM

Fig. 5. Activity Diagram

➢ *The activity diagram represents*

The process flow of selecting stocks for investment. The process starts when the investor opens the app and selects the "Investment" option. The system then presents a list of available stocks to the investor.

The investor can select a stock by clicking on it, and the system will then display the details of the selected stock, including its price, past performance, and other relevant information. The investor can then choose to add the stock to their investment portfolio or continue browsing other available stocks.

If the market trend indicates a downtrend near a support level, the system should prompt the investor to consider buying the stock.

If the market trend indicates an uptrend near a resistance level, the system should prompt the investor to consider selling the stock.

If the market trend indicates a sideways market, the system should prompt the investor to hold on to their current positions and wait for a breakout in either direction before making any decisions.

IV. FUTURE SCOPES

1. Integration with other trading platforms: system can also be integrated with various trading platforms to provide a seamless trading experience for traders.

2. Enhancement in model accuracy: The system's predictive model can be further improved by incorporating more data sources and refining the machine learning algorithms.

3. Expansion of the system's functionalities: The system can be extended to include other financial instruments such as

options and futures, allowing traders to diversify their portfolios.

V. BENEFITS:

1. Improved accuracy in predictions: By utilizing machine learning algorithms, the system can provide accurate predictions on future stock prices, allowing traders to make proper decisions.
2. Efficient trading: The system can analyze a large amount of data quickly and provide traders with signals to buy, sell or hold stocks, enabling them to trade efficiently.
3. Reduced risks: The system's predictions and signals can help traders minimize risks by providing them with stop-loss levels and other risk management tools.
4. Time-saving: The system can save time for traders by providing them with quick analysis and predictions on a particular stock, allowing them to focus on other aspects of trading.
5. Increased profitability: By providing accurate predictions and risk management tools, the system can help traders maximize their profits in the market.

VI. LITERATURE REVIEW

In 2019[1], Kim, Taewook, have presented the paper "Forecasting stock price with feature LSTM-CNN model using different representations of the same data.".. In addition, discover that a candlestick chart is the most appropriate stock chart image to use to forecast stock prices.

In 2019[2], Guo, Junming, and Xuwei Li have presented the paper "Prediction of index trend based on LSTM model for extracting image similarity feature.". This paper demonstrates how to predict the index trend more accurately to bring more profits to investors. Many researchers in the financial field have tried to use machine learning algorithms, such as Support Vector Machines (SVM), Random Forests (RF), and Deep Neural Network (DNN) like Convolutional Neural Network (CNN) and Long Short-Term Memory (LSTM) Network models to seek the dependence on the future trend of stock and historical stock data.

In 2019[3], Rundo, Francesco had presented the paper. in this paper we have seen that over the years, various machine learning techniques have been used in stock market prediction, but with the increased amount of data and expectation of more accurate prediction, the deep learning models are being used nowadays which have proven their advantage over traditional machine learning methods in terms of accuracy and speed of prediction.

In 2020[4], Xu, Yichuan have presented the paper "Stock Movement Prediction with Deep Learning, Finance Tweets Sentiment, Technical Indicators, and Candlestick Charting.". In first experiment, here used DNN to process collective sentiment on the news dataset from Kaggle, and then compare the performance between DNN and traditional machine learning approach.

In 2019[5], hen, Shun, and Lei Ge had proposed a paper "Exploring the attention mechanism in LSTM-based Hong Kong stock price movement prediction.". In this paper, Long-Short-Term Memory (LSTM) Recurrent Neural Network, one of the popular deep learning models, used in stock market prediction. In this task, the historical data of stock will be fetched automatically using python and fit the LSTM model on data to predict the prices of the stock.

In 2020[6], Nti, Isaac Kofi, Adebayo Felix Adekoya, and Benjamin Asubam Weyori have proposed a paper "A comprehensive evaluation of learning for stock market prediction.". This paper tackles stock market status prediction by bringing together natural language processing and technical indicators analysis to propose a system.

In 2020[7], Reddy, Satyaraj, et al have presented the paper "Performance and Analysing of Deep Learning Statistical Models on Enhancing Stock Market Portfolio.". In this paper we seen that the developed process should go through relevant data selection, data preprocessing to eliminate noise and missing values to create the prediction model.

VII. RESULT
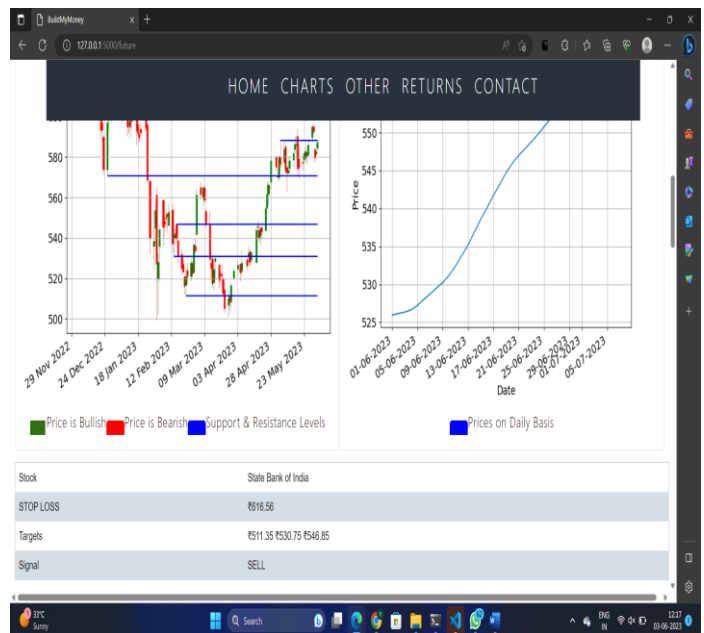
VIII. CONCLUSION

The system described is created for stock trading purposes and utilizes LSTM models to produce candlestick charts based on a given dataset. The output of the system includes four different types of charts, which can assist traders in visualizing the behavior of a particular stock and identifying trends.

Additionally, the system can generate signals to buy, sell, or ignore a stock with target and stop-loss levels, allowing traders to make informed trading decisions.

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