A Review on Artificial Intelligence in Stock Market

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Abstract: This paper essentially concentrates on the utilization of man-made consciousness and AI in the field of corporate share. The standards and qualities of KNN, k-Means, bisecting k-Means, and ANN algorithm are contemplated to analyse the impacts, similitudes and contrasts of various calculations. The calculations are carried out through Python programs for stock examination. As per the P/E proportion, profit rate, fixed resource turnover rate, net revenue and different marks of each stock, the stocks are characterized and grouped to anticipate the stock improvement prospects and give reference to choosing fitting speculation systems.
Keywords: Artificial Intelligence, Stock Market, Prediction, Stock price, Investments, Classification algorithm, Clustering algorithm, Machine learning

I. INTRODUCTION

Stock prediction focuses on estimating the future price movement in a stock, which is generally perceived as a challenging task due to the non-stationarity and volatility of the stock data. Dynamic stock market price variation and its chaotic behaviour have increased the price prediction problem where the extreme non-linear, dynamic, complicated domain knowledge inherent in the stock market has hiked the difficulty level for investors in making prompt investment decisions There are two traditional theories to take into account when estimating the stock price, namely, efficient market hypotheses (EMH) and random walk (RW) theory. Since market participants optimally use all known information, price fluctuations are unpredictable, as new information happens randomly Whereas according to the random walk theory, stock prices conduct a 'random walk', which means that all future prices do not follow any trends or patterns, and are a spontaneous deviation from previous prices, and an investor cannot possibly forecast the market The validity of the EMH and RW theory have been controversial. Therefore, with the emergence of computational and smart finance, and behavioural finance, economists have tried to establish another theory referred to as the inefficient market hypothesis (IMH), which states that financial markets are not always considered efficient markets.

II. ALGORITHMS

A. KNN Algorithm

K-nearest neighbours (KNN) algorithm is a sort of regulated ML algorithm which can be utilized for both classification as well as regression predictive problems. However, it is mainly used for classification predictive problems in industry.
KNN algorithm utilizes 'feature similarity' to predict the value of new datapoints which further implies that the new data point will be assigned a value based on how closely it matches the points in the training set.

B. ANN Algorithm

Artificial Neural Network can be best represented as a weighted directed graph, where the artificial neurons form the nodes. The relationship between the neurons outputs and neuron inputs can be viewed as the directed edges with weights. The ANN receives the input signal from the external source in the form of a pattern and image in the form of a vector.

C. K-Means Algorithm

K-Means Clustering is a unsupervised learning algorithm that is utilized to tackle the clustering issues in AI or data science.

D. Bisecting K-Means Algorithm

Bisecting k-means is a hybrid methodology between Divisive Hierarchical Clustering and K-means Clustering. Rather than partitioning the data set into K clusters in each iteration, bisecting k-means algorithm splits one cluster into two sub clusters at each bisecting step (by using k-means) until k clusters are obtained.

III. AIM

To make the stock market speculation process easy, less tedious and less monotonous, and make cycle of putting resources into stock market This framework will assist new investor with understanding the stock market rapidly and without any problem. To make beneficial exchange in stock market, investor need to anticipate the pattern of stock cost, future scope of stock price, which requires day to day refreshing of market developments, and watching out for day-to-day market information. This entire interaction makes the small investor or individuals with imperatives because of their routine struggle in the stock market keeping a standard update of such data becomes difficult for them.

IV. OBJECTIVES

1) Increase the accuracy of price prediction
2) Make stock market forecast simple and straightforward
3) Give valuable experiences to new investor to comprehend market rapidly.
4) Diminish the time expected to make forecast by giving various data analysis at a one point.
5) To make the stock market investment process simple

V. SCOPE

Predicting stock price range, unpredictability, risk, reward, pattern of stocks, examination of stock with other companion stocks, correlation with worldwide market will be accomplished utilizing stock's open, high, low, close, volume data, cost of different wares connected with stock, forex(currency) price. Sentiment analysis of news is performed to find overall sentiment of stock market investors. Consolidating this large number of information and different calculation's outcome to acquire better precision of expectation.

VI. RELATED WORK

The paper "Stock Market Forecasts Using Machine Learning" was written by authors Prof. S.P. Pimpalkar, Jenish Karia, Muskaan Khan, Satyamandand, Tushar Mukherjee. The paper states that the construction of the guesswork will use a variety of attributes such as input and will predict whether the market value will be positive or negative. The various attributes used in the model include oil, Foreign Exchange Rate, interest, gold and silver prices, NEWS, twitter news feeds and pattern matching. A variety of ML methods are used including Regression Support Vector Machine and Recurrent Neural Network [4]

The paper "Machine Learning Approach in Stock Market Prediction" was written by authors Raut Sushrut Deepak, Shinde Isha Uday, Dr D. Malathi. The paper states that a high level of accuracy and precision are the key parameters to be considered while predicting the share prices. Time series analysis,

fundamental analysis of companies, technical analysis is used by many shares market individual investors and institutions during the prediction. However, these methods are not completely reliable, so there is a need to provide supporting way to predict the stock market. In this paper, a Machine Learning method that will be trained in available stock data, acquire intelligence and use the information obtained to accurately predict. After extensive research of various algorithms and their robustness in the various problem domains, the Artificial Neural Network was more appropriate than any other algorithm.[5]

VII. EXISTING SYSTEM

Current models predict that the stock market uses only one algorithm to predict different conditions and variables and also does not combine multiple algorithm results or consider multiple algorithms to accurately predict. Previous results indicate that the stock price cannot be calculated using traditional divisions. The current system does perform optimally if there is a change in the operating surrounding because it does not focus on external events occurring in the surrounding such as news events and other factors affecting prices such as the Forex and Commodity market.[1]

The current system does not take into account certain important data such as trade volume and transaction value in the trading volume and the percentage of the amount that are be delivered and the percentage of delivery that predicts an investment or investment that occurs in a particular stock by a major fund manager or large investors. This feature is often overlooked by new investors and existing algorithms, that does not take these factors into account for better market movement analysis.[1]

Most of the existing systems uses only one algorithm and one data at a time. The existing system also does try to predict share prices in all conditions and on all days but in real world share market cannot be predictable every time so certain conditions need to be checked before predicting share market.[1]

VIII.   PROPOSED METHODOLOGY

The system is divided into the following modules:

A.   Data Collection

Data is collected from various sources, such as yahoo finance and google finance, which are in the form of .csv format. For news data gathering system uses Google News api.[1]

B.   Analysis Manipulation and Visualization of data

Data collected is cleaned to use it in algorithms and also data visualisation is performed.

C.   Build a Model

The cleaned and pre-processed data is used to create, build and train various machine learning algorithms which can be used in predictions [2].

D.   Predict Outcomes

After the model has been built successfully, the next thing to do is predict an outcome pattern for a particular stock and check the accuracy of the predictions.[1]

E.   Predict Combining Results Of All Algorithms

After models are built system combines their results for better prediction and high accuracy and predicts the output based on real time data provided to it.[1]

In this proposed system, we aim to predict the future share prices using various machine learning methods. In this proposed system, we were able to train and test the algorithms of ML from the different data points from the past for making the future share price estimation.

The sklearn library which is used for actual calculation, estimation and prediction. The data we used was of historical share markets, and was gathered from the various public and open sources available online, and 85 or more percentage of dataset was used to training of the ML models depending upon the need and the rest was used for validation and testing purpose [3]

IX.   CONCLUSION

The best approach for calculating stock price accurately we should use multiple algorithms such as ANN, Random Forest, SVM, LSTM and combine their results for predictions, and also consider the factors affecting stock market price The algorithms are an extraordinary resource for investors and financial institutions or investment in share market as they are trained on a huge collection of past data and have been picked subsequently to be tested on sample data.

X.   FUTURE SCOPE

Utilizing more granular data like data of each and every moment, each second or tick by tick information can further develop accuracy of prediction as it contains more insightful data than one day information. Future work contains providing prediction and proposals for individual as per its gamble and reward appetite, and furthermoreproviding a portfolio management to mitigate the risk associated with investing in stock market. Cycle of placing orders and making trades can be automated which work as indicated by ideas given by AI and ML algorithms, which can eliminate human mistakes and factors like apprehension and avarice of person which can bring faster and more profitable trading.

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