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Stock Market Prediction Using Machine Learning

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ABSTRACT: In this project we analyze existing methods and then proposed new methods for stock market prediction. We take three different approaches at the problem: Fundamental analysis, Technical Analysis, and the application of Machine Learning. We find evidence in support of the weak form of the Efficient Market Hypothesis, that the historic price does not contain useful information but out of sample data may be predictive. News which is relevant to any Share market listed Company is effective on further movement of stock. We show that Fundamental Analysis and Machine Learning could be used to guide an investor's decisions. This is where Machine Learning techniques help. Understanding that analysis of numerical time series gives close results, intelligent investors can use machine learning techniques in predicting the stock market behavior. Train the dataset using SVM algorithm and predict the stock market. When analyzing recent transaction data, how can we derive meaningful insights to forecast future fluctuations in stock market prices, given a financial time series like the S&P 500 or other historical data? Recent research on this matter provides preliminary evidence that machine learning approaches can finding (non-linear) dependencies in price sequences in the stock market. As a result of the stock market's extreme volatility and non-stationarity, predicting the trend of a financial time series is still quite difficult. In this paper, we proposed a novel approach to sequence reconstruction using motifs (frequent patterns) to simplify noisy financial temporal series. A convolutional neural network is then used to capture the spatial structure of the time series.

KEYWORDS:

1) Artificial Intelligence
2) Machine Learning
3) SVM
4) Feature Extraction
5) Classification
6) Data Analytics
7) Stock Market.

I. INTRODUCTION

A time series in the financial stock market is a progression of a certain share's price. The investment's ability to forecast the direction of financial time series is very crucial. Because of the microstructure of the financial market, these financial time series differ from other time series in a few unique ways. One fundamental characteristic is the high frequency of individual values, which increases the impact of non-systematic influences on the dynamics of those time series. Financial time series thus show significant volatility and non-stationarity. The job of financial time series forecasting has been shown to be difficult due to its inherent unpredictability; traditional statistical models machine learning techniques [7], and artificial neural networks have all been extensively studied in this regard. The majority of models now in use place a strong emphasis on accurate price prediction. On the other hand, some study is being done on predicting the direction of prices, or the upward and downward trends of the time series. Future considerations are the focus of trend forecasting. Zhong-Ke Gao, the associate editor in charge of overseeing the manuscript's assessment and clearing its publication, noted that volatility tendencies outperformed precise price projections. It offers investors a decision-making message from an other angle. Some new methods have recently been developed to address this issue. For example, Ding et al. [25] coupled Natural Language Processing methodology with Deep Learning (DL) technology in their series of experimentsThey use financial news to examine the effects of stock market volatility from the standpoint of external information in financial markets. In particular, they process the title of financial news stories using named entity recognition technology and then utilize a neural tensor network (NTN) to extract features from the news entities. They forecast the price movement of individual stocks as well as the S&P 500 index using a multi-layer NTN model. Their approach, which differs from conventional research methods and analysis techniques, is capable of accurately capturing market movements based on financial news. However, the accuracy and timeliness of news is

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crucial to their function.

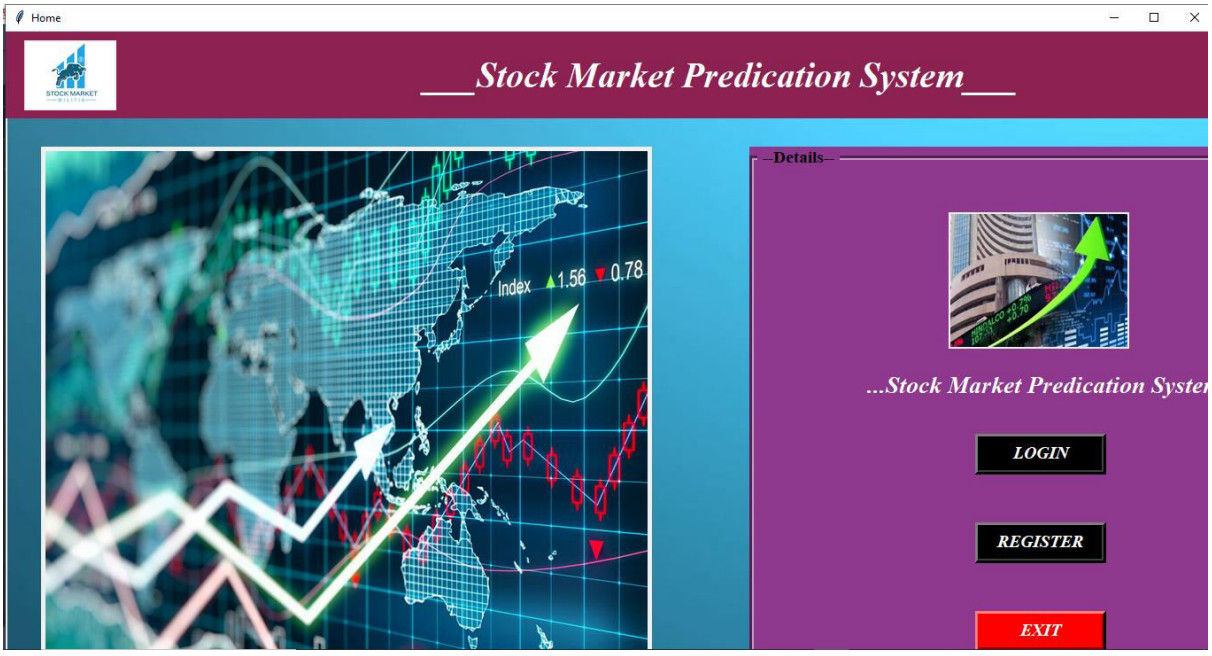
II.METHODOLOGY

Support Vector Machine:- In machine learning, support-vector machines (SVMs, also support-vector networks) are supervised learning models with associated learning algorithms that analyze data used for classification and regression analysis. Given a set of training examples, each marked as belonging to one or the other of two categories, an SVM training algo- rithm builds a model that assigns new exmples to one category or the other, making it a non-probabilistic binary linear classifier (although methods such as Platt scal- ing exist to use SVM in a probabilistic classification setting). An SVM model is a representation of the examples as points in space, mapped so that the examples of the separate categories are divided by a clear gap that is as wide as possible. New examples are then mapped into that same space and predicted to belong to a category based on the side of the gap on which they fall. Two types of SVM
Linear SVM: Linear SVM is used for linearly separable data, which means if a dataset can be classified into two classes by using a single straight line, then such data is termed as linearly separable data, and classifier is used called as Linear SVM classifier.
Non-linear SVM: Non-Linear SVM is used for non-linearly separated data, which means if a dataset cannot be classified by using a straight line, then such data is termed as non-linear data and classifier used is called as Non-linear SVM classifier.

III. MODELING AND ANALYSIS

- Gui design
- Dataset
- Dataset cleaning
- Data processing
- Login page
- Registration page
- Training
- Testing

IV. RESULTS



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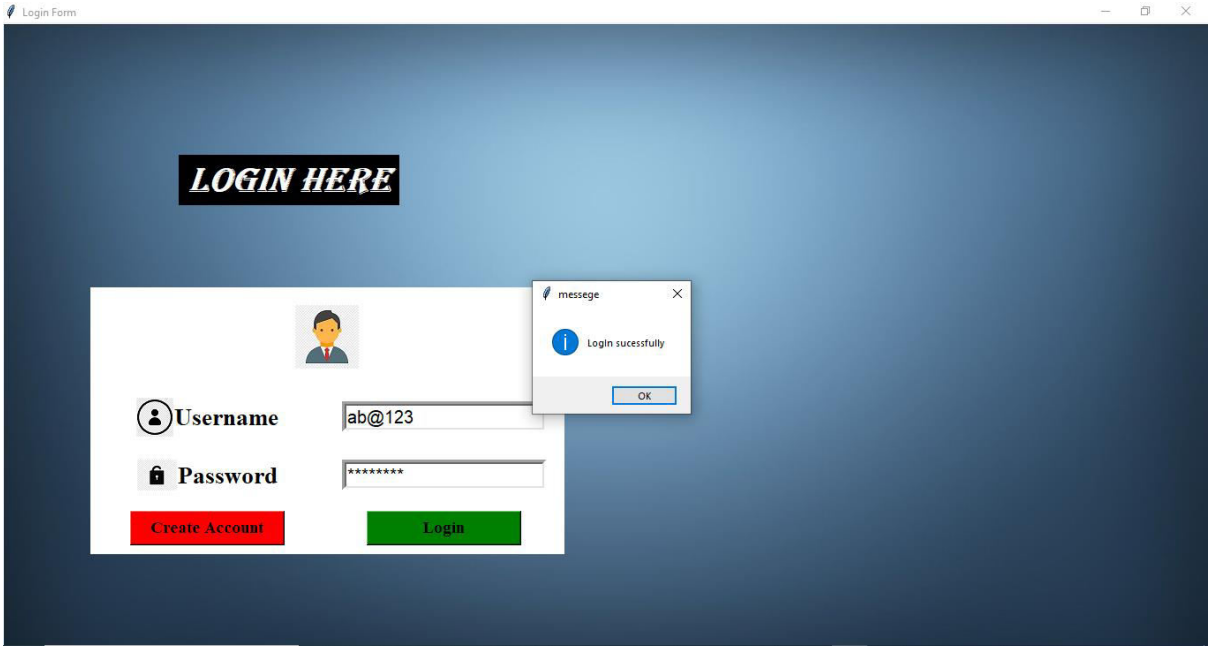

V.CONCLUSION AND FUTURE WORK

Conclusion:- We present a brand-new method for predicting financial time series trends by reconstructing time series using high-order configurations, or themes. Convolutional neural networks are used to understand the underlying patterns in the reconstructed sequence, which yields valuable information for predicting ups and downs. When compared to current research using sequential models like recurrent neural networks, our approach is noticeably more computationally efficient. However, experimental results support the effectiveness of our method in capturing stock share trend information and demonstrate its superior performance on real financial time series datasets. Our approach offers a fresh approach to price prediction while shedding light on the macroscopic pattern identification in financial time series.

Future Work:-
Various stock indices, including the S&P 500, NYSE, NSE, BSE, Dow Jones Industrial Average, and NASDAQ, are used for the experiment. Analysis of the experiments shows that LSTM works better and offers higher prediction accuracy than SVR. In the future, a variety of deep learning methods, including CNN and hybrid models, will be used to assess prediction accuracy. Additionally, several evaluation metrics, including RMSE and MAE, will be applied to assess prediction accuracy.

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