Financial Market Analyzer and Predictor

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**Abstract:**

In this thesis, we discuss the possibility of prediction of the financial market using statistical and machine learning methods. Prediction of stock market is an interesting domain and has attracted a significant amount of attention in financial markets in the world. We have tried to predict the movement of a stock and in general the market by studying the patterns associated with it via machine learning tools. Here, FMAP predicts the price of various stocks by looking at the previous value of the stocks involved. The effectiveness of this model is verified by checking its accuracy and matching it with the actual current market value.

**Introduction**

Purpose of Study

The main motive for undertaking this project has been to study the structure of the financial markets and test our ability to predict the movement only from an educational standpoint. What as a user should understand that the financial market is very volatile and its changes are due to many reasons like external stimuli, company structure ie. Profit sheet, cash flow statements, etc which is very complicated to be taken into consideration. FMAP only considers the mathematical aspects of the stock value and tries to predict its future movement. Any discrepancies here can be attributed to this aspect.

**Prediction Method:**

FMAP uses machine learning methods to predict the value of a stock by taking input of the stock price before the prediction. This can be 5 minutes, 10 minutes or any other time slot.

This program feeds these values into a neural net model trained on the stock prices from the training set. The training data set includes historical stock prices, primarily covering a period of 10 years. Each attribute here is assigned a specific weight and bias is decided. An optimizer takes care of the necessary computations that are used to adapt the network’s weight and bias variables during training. Here, Adaptive Moment Estimation optimizer is used. A batch of X values goes through the network and predicts the Y values. This goes through numerous epochs in this case 10, to fit the curve as perfectly as possible. The user can also see the difference between predicted and actual value(Trend Accuracy) and the accuracy of predicting movement.

**Interface**

FMAP has a very basic user-friendly interface which has many functionalities. The user has the option to select the stock he wants to see the current and the future values of. He then has the option to compare it with other stocks and its predicted value as well. The stock chart is visually rich and hovering over reveals price and other details. User can change the time frame used(hourly,monthly, etc). The main motive of FMAP is to give the user financial advice about the stock. FMAP gives its view on investment by looking at the future trends of the stock value.

**Conclusion**

The underlying objective of taking this project was to learn the basic machine learning and data science methods and implementing them to analyze and predict the stock movement. FMAP tries to understand the mathematical and statistical forces running behind the stock market and use them to predict the value of a company. The accuracy generated is satisfactory and can be used in future studies.