Financial Markets 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 SP 500 index value by looking at the stock value of the 500 companies 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 SP 500 stock by taking inputs, the stock values a minute before, of 500 companies involved.

This program feeds the values into a training set which then after multiple iterations produces a test data set which is then displayed and matched for accuracy. The training data set includes 80% of the total dataset. The neural nets are then displayed graphically by TensorFlow. 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 accuracy and the error has also been calculated to give the user a mathematical idea along with the visuals.

**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 as well. There is a functionality provided for the user to change the time frame to see the stock value. 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.