Predicting America's Stock Market during Pandemic using Machine Learning

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1 Description

Stock market is an essential part of the economy of a country.The stock market plays a crucial role in the growth of the industry and commerce of the country that eventually affects the economy of the country to a great extent[1]. The key rationale for government or an industry to keep a close watch on the events of stock market is because a rise in stock market is an indication of a emerging industrial sector which in turn paves a way for growing economy of the country but a decline in stock market indicates significant loss of wealth, hence it is vital to have great analytics and forecasting of stock market.

The year 2020 has witnessed a dramatic decline in stock market for most industrial and government sectors due to the potential worsening of COVID-19 pandemic – a threat for lives mentally and economically. A stock market crash in March 2020 has resulted in a tremendous downfall of US economy which has spun and muddled the global economy.However, recent improvements is a sigh of relief, the U.S stock market closed at an all time high in the month of September 2020, staging a stunning turnaround propelled by Big Tech industries[2].

Even after years of study by the smartest brains in finance, there was not a great approach to understand the unexpected failure or success in the current stock market. Innovation and technology has always been a tool to forecast unprecedented changes that could result in stock market. Predictions go arm-in-arm with supervised machine learning[3], the algorithms and procedures can define the current state and predict the future for an improved analysis. We can get valuable insights from social media notably from Twitter which has billions of users who put in their thoughts. Combining these supervised algorithms, human interaction on Twitter and data-sets which is readily available on various stock indices result in better analytics and forecasting.

2 Survey

2.1 What has been done?

There are numerous stock market forecasting tools, analysis which is being done day in and day out[4][5], there are mobile and web applications which provide handy information on stocks, some of those applications use Twitter sentiment analytics with machine learning algorithms and some applications use traditional forecasting by using just the fundamental analysis of how the company is being tied up to their products and the total number of shares owned.

2.2 What is being done?

The work which is being proposed has a potential to provide a better insight by including great machine learning algorithms such as Bagging Regressor, Random Forest Regressor and so on. Human interactions on twitter together with graphical visualization tools which benefits not only the industries but to a common man in general who would like to just have an eye on his investments and understand the forecasting on his stocks. The graphical visualization for SP 500 stocks, a very well-known stock

market index along with the effects of pandemic is being combined.

The data-sets are derived from NASDAQ and Yahoo. Some of the data are being normalized to provide better insight on the future. The data on pandemic is pre-processed by ourselves with reference to the data available on Worldometer which provides real-time statistics on coronavirus pandemic.

2.3 Key Features

• Accurately forecast the direction of stock in short term and forecast approximately over long term by utilizing machine learning algorithms.
• Utilize Twitter sentiment analysis, stock market data available on NASDAQ, Yahoo and pandemic data available on various sites notably Worldometer
• Visually representation the output data using a graphical application or in-build GUI.

2.4 Milestones

• 10/10/2020 – Project Proposal
• 10/28/2020 – Runnable Project
• 11/01/2020 – Intermediate project Report
• 11/07./2020 – Testing Project
• 11/11/2020 – Implementing Visualization tools
• 11/17/2020 – Documentation and Presentation

2.5 Task Planner

Week 1: Researching more about the project collecting more data-sets by narrowing the data-sets for the desired features.
Week 2: Solving the project problem theoretically to check the performance of algorithms.
Week 3: Starting the coding part using the python language and implementing machine learning algorithms.
Week 4: Testing for the bugs and reliability of the project.
Week 5: Using visualization tools to represent stock market data.
Week 6: Documentation of evaluation, reporting, and demo presentation.

3 References

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