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| Comment category | Comment | Edited |
| grammatical errors | 1. …is called the tunning process…(misspelling) 2. From the year of 2019 and 2020 (wrong preposition) 3. Not only many has… (wrong verb form) 4. data consisting of non-linear relationship, which long-term stock price datasets usually are non-linear. (Wrong preposition) | 1. …is called the tuning process… 2. From the year of 2019 to 2020 3. Not only many have … 4. data consisting of non-linear relationship, as long-term stock price datasets usually are non-linear |

With unexpected catastrophic like COVID-19, global economy is experiencing a huge challenge. Not only many have lost their lives, but also many families have lost their jobs and/or their source of income during the pandemic. It is important to perform investment and financial management to counter such unpredictable events. Stock market is one of the best investments for most people [1]. Even though it could be risky, but it is flexible and profitable if investors are familiar with the market. From the year of 2019 to 2020, the whole stock market has been through a roller coaster ride. Many would say the stock market is unpredictable and forecasting stock market requires investors to have extensive knowledge and background information.

With the power of the computer, analysists would establish traditional statical models or use machine-learning algorithms to study the trend of the stock and forecast the price of a stock. The Autoregressive integrated moving average, ARIMA, is widely used in time series forecasting due to its ability to perform short-term prediction [2]. The simple ARIMA model takes in three integer inputs, p, d, q. Finding the combination that would fit the trend of the data is called the tuning process, which could be tedious without the help with technology [3]. A downside of ARIMA model is its deficiency with data consisting of non-linear relationship, as long-term stock price datasets usually are non-linear.

Machine learning algorithms can better predict datasets that contain nonlinear relationship [4]. Recently, Facebook and Amazon have developed their time series prediction model. This paper is going to explore if a hybrid model of ARIMA and Facebook Prophet, Amazon SageMaker DeepAR would be more effective in modeling the trend and accurately predict the NASDAQ index. NASDAQ index is chosen for this paper is because it calculated from the performance of a collection of stocks [5]. NASDAQ index can reflect on how the stock market performs as a whole.

In order to merge two algorithms, the dataset would be cleaned and fitted using the ARIMA model. The residuals would be passed into Facebook Prophet and Amazon SageMaker DeepAR network to perform training and forecasting.

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