**1.Project Title**: Stock Market Analysis and prediction

**Team Members**:

• Prathyusha Daroor

• Likita Chamakura Suresh

• Sowrab Sahini

• Naga Srija Guntupalli

**2.Goals and Objectives:**

• **Motivation:**

There are two ways of predicting stock market – fundamental analysis and technical analysis. So, we would like to combine the power of fundamental and technical analysis to analyze stock market data.

• **Significance:**

* As many investment companies and individuals today are very much active in stock market, they perform regular research by following news, studying the company trends and others before making any investment.
* Building models by training it with past and current data is useful to investors and traders to have a proper understanding of the market fluctuation helping them to make better decisions for trading and investment.

• **Objectives:**

The main objective is to improve stock market analysis using sentiment analysis, logistic regression, and Neural Networks.

• **Features:**

Given a stock market ticker we analyze the financial documents of the given company and will also predict the stock prices and visualize the prices over time.

**Increment 1 guidelines**:

* **Related work (Background):**

We have tried to understand about the stock market and its predictions, the way it helps the investors. We have also tried to understand what kind of data we are supposed to use. Also, tried to understand which deep learning algorithm best fits the requirement. [1] [2]

* **Dataset:**

TINGO API from panda’s data reader. This is used to get the historic data of the specified company using the API key. [3]

Graphical user interface, text, application, email

Description automatically generated

**Fig:** Top 5 values of the Dataset

Chart

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**Fig:** Visualizing the dataset

* **Detail Design of Features:**
* The main feature of increment 1 is to use deep learning to predict stock performance for upcoming 30days which helps the investor to take the decisions to whether buy or sell the stock.
* In this increment we are using LSTM (long short-term memory) layer as our model which are being imported from KERAS library. [4]

Table

Description automatically generated

**Fig:** LSTM model

* **Analysis:**

While analyzing for the models which can be used for stock market prediction (time series data) we found out that LSTM is one such deep learning model which can be used to predict stock market data. [4]

* **Implementation:**
* To implement the stock market prediction, we use the data from TIINGO API as our source of historic data of the specified company ticker. [3]
* We are dividing our dataset into two parts – training and testing datasets. Out of the total 300% of the data we split the dataset into 65% training dataset and the rest into test dataset.
* We reshape the data to fit into the LSTM model then we use the LSTM to build the model and train the data. [4]
* The number of epochs for our model is 300. After training the model we predict the data.

Chart, line chart

Description automatically generated

**Fig:** Prediction for upcoming 30days Stock price.

* **Implementation Status Report** 
  + **Work Completed** 
    - **Description:** Developed deep learning model to predict upcoming 30days stock price.
    - **Responsibility (Task, Person):**

Background research work: Prathyusha Daroor, Sowrab Sahini

Designing: Prathyusha Daroor, Guntupalli Naga Srija

Coding: Sowrab Sahini, Likita Chamakura Suresh, Prathyusha Daroor, Guntupalli Naga Srija.

Documentation for this phase: Likita Chamakura Suresh, Sowrab Sahini

* + - **Contributions (members/percentage):**

Prathyusha Daroor: 25%

Likita Chamakura Suresh: 25%

Sowrab Sahini: 25%

Guntupalli Naga Srija: 25%

* + **Work to be completed** 
    - **Description:**
* Need to develop classification model by reading the data from annual report submitted by publicly traded company(30-K) to SEC(U.S Securities and exchange commission).
* Develop shallow learning model and compare the results between shallow and deep learning models.
  + - **Responsibility (Task, Person):**

Background research work: Prathyusha Daroor, Sowrab Sahini

Designing: Prathyusha Daroor, Guntupalli Naga Srija

Coding: Sowrab Sahini, Likita Chamakura Suresh, Prathyusha Daroor, Guntupalli Naga Srija.

Documentation for this phase: Likita Chamakura Suresh, Sowrab Sahini

Testing: Likita Chamakura Suresh, Guntupalli Naga Srija.

# References

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| [1] | M. Zu, "NLP for Stock market prediction with reddit data," [Online]. Available: https://web.stanford.edu/class/cs224n/reports/final\_reports/report030.pdf. |
| [2] | "U.S security and exchange commission," 9 jan 2017. [Online]. Available: https://www.sec.gov/edgar.shtml. |
| [3] | "TIINGO," [Online]. Available: https://api.tiingo.com/documentation/general/overview. |
| [4] | "Keras LSTM layer," [Online]. Available: https://keras.io/api/layers/recurrent\_layers/lstm/. |

**GitHub Link:**

https://github.com/sowrab-sahini/SMAP/tree/main/src/increment1