

**PROJECT PROPOSAL**

**Word Count (excl. appendix & references) – 1,100**

**PROJECT TEAM 7**

1. **OVERVIEW**
2. **RESEARCH QUESTION:**

**How can we use data analytics to forecast the Stock Price Trends?**

1. **BACKGROUND AND RELEVANT LITERATURE:**

We have seen movies in which stock traders are buying thousands of hot stock shares or dumping shares of plummeting stock. We have seen many commercials for brokerage firms that claim to have exciting prospects and strong portfolios.

So, we are interesting how these traders and firms predict stock price and the best timing to sell the stock?

There is no magical way to predict the stock market. However, we can predict the share prices by studying the historical trends.

The primary objective of this academic research is to use Data Science techniques to forecast the trends in Stock Price by looking historical data, trends and patterns. Hence, this study including by:

* Extracting historical and Realtime data from stock market price of India Bank from NSE’s website
* Build a model to forecast possible trends in next 3 months base on the current and historical data.

1. **OBJECTIVE, SCOPE, SOURCES AND DELIVRABLES**
2. **PROJECT OBJECTIVES**
3. **Observe** the stock price trend by analyzing the historical and current data.
4. **Visualize** the stock price trends and highlight possible trends of the next 3 months.
5. **Evaluate** the forecasting model validity by testing the data that we currently have in hand.
6. **PROJECT SCOPE**
7. **Geography**

* Mainly focus to Banks from INDIA from National Stock Exchange website.

1. **Dimensions**

*Chronological:* this stock trend forecast model is based on the timeframe from Jan 2018 to Jan 2022. This could include:

* Analysis differences the stock trend in some majority events in the world such as pre-pandemic and pandemic control period
* Analysis and predict by considering the possible trends in the forecast model to express both normal period and sensitive period (e.g.: pandemic)

*Regional:* Analyzing the stock trend data from the selected time frame across Banks from INDIA. This could include:

* Testing our forecast model accuracy.
* Visualize the forecast trend to have better interpretation by end users.

1. **Out of Scope**

This study will only focus on predicting the stock price trend based on historical data hence, it will not consider that might happen in future such as bankruptcy, environmental or global economic challenges.

1. **POSSIBLE DATA SOURCES**

* We found many datasets from different sources that can be used for this project. After comparing all datasets, we have decided to use NSEpy library to extract the historical data for SBIN.
* This library can access real time data from National Stock Exchange website so it is easy and simple to use API.
* The main objective of NSEpy is to provide analysis ready data-series. We can easily integrate it with Technical Analysis libraries.

*Exhibit 1: Possible data sources*

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Type** | | **Source** | **Reference** |
| NSEpy Dataset | Key Data Source | National Stock Exchange website | https://nsepy.xyz/ |
| Stock Exchange Data | Other possible  data sources | Yahoo Finance | https://www.kaggle.com/datasets  /mattiuzc/stock-exchange-data |
| Huge Stock Market Dataset | Other possible  data sources | NYSE, NASDAQ, and NYSE MKT | https://www.kaggle.com/datasets  /borismarjanovic/price-volume-data-for-all-us-stocks-etfs |

1. **DELIVERABLES**

* A Jupyter notebook / Python Script to train model for stock price forecasting
* A trained model for stock price forecasting with most accurate results
* A Jupyter notebook / Markdown file containing Exploratory Data Analysis and key findings
* A dashboard visualising key finding and price forecasting

1. **PROJECT ACTIVITIES**

**A. PROJECT IDEATION**

* Initial Discussion
* Finalizing Project Topic
* Identified Tasks Required
* Creating project plan / Timeline
* Draft Project Proposal
* Do Research

**B. SCOPING**

* Define Scope of Data: Work Breakdown Structure
* Identified sources of data.

**C. DATA WRANGLING: PREPARATION DATA SET FOR ANALYSIS**

* Data Acquisition: Identify data.
* Unifying Data: Combine the revised data for analysis.
* Data Cleansing: Removing any unnecessary data and redesign data into functional format.

**D & E. MODEL DEVELOPING & DATA ANALYSIS**

* 80% of the data will be used for training.
* We will train four widely used models for stock price forecasting.
* ARIMAX-SVR
* Random Forecast Regressor
* LSTM
* Benchmark GAN

**F. MODEL TESTING**

* 20% of the data will be used for testing.
* We will use RMSE as an evolution measure to compare the performance of models.

**G. INTERPRETATION & COMMUNICATION**

* Creating & design a dashboard visualizing key finding and price forecasting
* Writing Summary Report in a markdown file
* Preparation & Practicing for project viva

1. **PROJECT MANAGEMENT AND CONTROL**
2. **METHODOLOGY**

**Agile project management principles** will be used as the group is formed with small number of members, each stakeholder will be involving at every stage, the project requirements are liable to change, if necessary, frequent testing is required, and the project needs to be finished within a short period.

As part of Agile, **XP methodology** and **Kanban approach** will be used.

**XP Practices**

**Pair programming**: team members will be working side by side to develop code together

**Daily Deployment**: continuous practice at least once a day

**Work Environment**: As this is a group work, approach of making each team member feel they are needed and important for team’s success will be used.

**Sit Together**: sometimes, it is necessary to sit face-on-face discussion to maximize effectiveness.

**Key meetings, cycles, and task delivery**: Tasks will be reviewing weekly including last’s week progress, and discussing how to improve the process

**Kanban Practices**

**Prioritize**: Tasks will be prioritized in terms of their nature and type

**Limit WIP**: Tasks which are in progress will be reduced accordingly in order to move quickly to the next stage for faster values

**Visualize**- work flow will be also managed by visualizing with Kanban board

**Manage flow**: workflow will be observed, measured, and informed at every stage

**Collaboration:** Team will be made sure to have a common concept of work and shared understanding of problems for enhancement

**Early feedback**: Feedback from different stakeholders will be asked to help eliminate risk.

1. **TOOL**

* Project Management Documentation: Monday.com, MS Project
* Data, code and deliverables: Gitlab, File Exchange (UWE Blackboard)

1. **TEAM ROLES**

**Principle:** Since all members have their own strength based on their professional experiences, the role and responsibility will be allocated equally in order to maximize effectiveness and minimize time consuming. Support each other as necessary and sharing the workload by leveraging one team mindset.

Specific team roles for activities A and B have been allocated and might be shifting roles and responsibility in the later stage.

1. **PROJECT TIMELINE**
2. **VIEWING TOP-LINE PROJECT PLAN**

*Exhibit 2: Top-line Project Plan*

**Graphical user interface, application

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1. **DETAILED PROJECT PLAN**

A live project plan containing detailed tasks and responsibilities is managed via MS project Management tools, Excel and Monday.com Project management board. The aim is to finalize our project a week before our project presentation.

Table

Description automatically generated*Exhibit 3: Detailed Project Plan*

**APPENDIX**

*Exhibit 4: Project Management Board, Monday.com – Screenshot (16 June, 2022)*

A picture containing background pattern

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*Exhibit 5: Kanban Board, Monday.com – Screenshot (16 June, 2022)*

Graphical user interface, application

Description automatically generated

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