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# Executive Summary

This is a project proposal for “Stock Price Trend Prediction” using Machine Learning and Neural Networks. Stock market data is one of the most interesting for analytics, as just a single individual value “Stock Price or Price of a Stock” is the basis of multiple complex data patterns when it is perceived with a time factor. This representation of stock price recorded in succession over a period makes it a time series data.

This project will take a recorded history of stock price over a period and will use Machine learning to learn the pattern of price with trend. Neural networks will be used to make the price prediction for the given stock based on the learnt patterns. After every test run, based on outcome, the Network will be re-configured to improve the prediction accuracy.

# Goals

1. Compare the Network’s price trend prediction with the actual price trend and achieve the prediction that is closest to the actual price trend of selected stock.
2. Enlist the input parameters (features), contributing to the best possible prediction.

# Problem Statement

Identify and evaluate list of input parameters (features) contributing to the best possible prediction of stock price trend, when using neural networks.

# Value Statement

This project will set the baseline for studies ahead to identify, test and understand the additional significant features for long term (1 year) and very long term (5 years) price trend prediction in stock market. This study can also be used in price trend prediction in commodity markets where the operating environment is like stock market.

# Strategy

Strategy to achieve the goal, is by creating a network that can learn and make predictions on time series data. Reconfigure the network over multiple iterations to achieve the near actual trend of stock by using one or combination of given techniques (back-propagation, dropout etc.)

Following steps will be covered:

1. For a selected period (1 year) , download the daily data of Stock will be downloaded from the official site of NSE (National Stock Exchange – India): <https://www.nseindia.com/all-reports>
2. Clean the data (drop data for missing values, incorrect values)
3. Select data with correct date and stock price value.
4. Identify an individual stock for the training, testing and validation.
5. Separate the data for training (Training Data – for 6 months) and testing (Test Data – 3 Months).
6. Network Training process:
7. Run the training process.
8. Record the output.
9. Record the weights and error data.
10. Minimize the error.
11. Network Test process:
12. Run the testing process with the weights optimized in the training.
13. Record the output.
14. Compare the network output with the actual stock price for the comparison period.
15. Repeat the steps for network training and testing multiple times to until the prediction is closest to the actual price trend and with the minimum error.

# Project Scope

What is in scope of this project:

1. Data Collection of stock price from a public website of National stock exchange (India)
2. Coding the Neural Network
3. Recording the output of the network
4. Reconfiguration of the network
5. Project Report

What is NOT in scope of this project:

1. Testing and recording performance data for multiple algorithms.

# Project Deliverables

# Measure of success

Network’s price trend prediction is within 15% range of the actual price trend (or achieve the closest possible prediction)

# Timeline

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Dates | Duration | Status |
| 1. Download Data for 1 year | 1st Apr 24 – 5th Apr 24 | 05 days |  |
| 2. Data cleansing | 8th Apr 24 – 9th Apr 24 | 02 days |  |
| 3. Code and Unit test Neural Network | 10th Apr 24 – 20th Apr 24 | 10 days |  |
| 4. First Training Run | 22 Apr 24 – 23 Apr 24 | 02 days |  |
| 5. First Test Run | 25 Apr 24 – 26 Apr 24 | 02 days |  |
| 6. Analyse the Network output | 27 Apr 24 – 28 Apr 24 | 02 days |  |
| 7. Reconfiguration of the Network | 29 Apr 24 – 30 Apr 24 | 02 days |  |
| 8. Create Project report | 1May 24 – 5 May 24 | 5 days |  |
| 9. Submit Project report | 6th May 24 | 1 day |  |

1. Timeline from 1-Apr-24 to 6th May 24