DS5220 Project Proposal

Project Title – Short-term stock market price prediction

Team –

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Project Description

Problem Statement: To predict prices of stocks listed on NYSE and NASDAQ on a short-term basis using technical indicators.

Dataset Description

Link:
https://www.alphavantage.co/ (Provides Python API to fetch data)
https://github.com/bukosabino/ta (Technical Analysis Library for Python)

Description:
Alpha-Vantage Python API returns intraday time series (timestamp, open, high, low, close, volume) of the equity specified.
TA Python library derives technical indicators from these basic stock features.

Number of Records:
Data available from 1min to 60 min intervals. Hence, data volume is around 24 to 1440 records per day. Data is collected for 1-2 years (> 10,000 daat points).

Feature Dimensionality:
API returns 5 features (open, high, low, close, volume). Around 20 technical indicators are derived from it using Python TA library.

Approach and Methodology

Normalization: Standard Scaling.

Feature Selection/Engineering: Done with Python TA library.

ML models to be used: Support Vector Regressor, Random Forest, AdaBoost, Neural Network

Train-Test Split: Since stock price prediction can be done only on past data, training data will be at timestamps before testing data.
For hyper-parameter tuning, we will use GridSearch.

Language and Packages:
Python
Scikit-Learn
Keras
TA API
Alpha-Vantage API
Other common libraries like numpy, pandas, matplotlib, scipy

Metrics:
Mean Absolute Percentage Error
Root Mean Squared Error
(Commonly used regression metrics)