Project proposal

Graded

Group

Jiacheng Zhang
Da Teng
Fan Han Hoon
View or edit group

Total Points

10 / 10 pts

Question 1

Project summary

4 / 4 pts

✔ **– 0 pts** Correct

– 0.5 pts Partially failed to either: 1. Does the summary clearly explain what your proposed project will consist of? or 2. Does it adequately motivate why the topic is interesting?

– 1 pt Failed to either: 1. Does the summary clearly explain what your proposed project will consist of? or 2. Does it adequately motivate why the topic is interesting? Or partially failed to: 3. Does it explain all necessary background information and define all necessary notation in a way that would be clear to an average member of this class?

– 2 pts Failed to: Does it explain all necessary background information and define all necessary notation in a way that would be clear to an average member of this class?

1 The project summary is over clear. The quality is good.

Question 2

Project plan

4 / 4 pts

✔ **– 0 pts** Correct

– 0.5 pts Partially failed to do one of the following:
-Does the project plan/task list clearly explain the proposed plan of attack?
– Are tasks clearly defined in a measurable way?
– Are the tasks realistic?
– Have the authors considered all relevant contingencies/challenges?

– 1 pt Failed to do one of the following:
-Does the project plan/task list clearly explain the proposed plan of attack?
– Are tasks clearly defined in a measurable way?
– Are the tasks realistic?
– Have the authors considered all relevant contingencies/challenges?

– 2 pts Failed to do 2 of the following:
-Does the project plan/task list clearly explain the proposed plan of attack?
– Are tasks clearly defined in a measurable way?
– Are the tasks realistic?
– Have the authors considered all relevant contingencies/challenges?

– 3 pts Failed to do 3 of the following:
-Does the project plan/task list clearly explain the proposed plan of attack?
– Are tasks clearly defined in a measurable way?
– Are the tasks realistic?
– Have the authors considered all relevant contingencies/challenges?

– 4 pts Failed to do all of the following:
-Does the project plan/task list clearly explain the proposed plan of attack?
– Are tasks clearly defined in a measurable way?
– Are the tasks realistic?
– Have the authors considered all relevant contingencies/challenges?

Question 3

Overall clarify

2 / 2 pts

✔ **– 0 pts** Correct

– 0.5 pts Failed to adhere to: "Is the document free of typos and spelling/grammatical errors?" or "Are all figures (if any) clearly described and legible?"

You may also receive a deduction for the form of your report if there is inconsistency.

– 1 pt Failed to adhere to: "Do the ideas in the proposal flow together in a clear/logical manner?"

Project Proposal

Team Members:
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Project Summary: Predicting Stock Trends Using Machine Learning

The task of predicting stock trends is of immense interest to investors, traders, and financial analysts alike. The ability to accurately forecast whether a stock's price will rise or fall can lead to significant financial gains or losses. Machine learning techniques offer promising avenues for tackling this challenge by leveraging historical data patterns to make predictions about future stock movements. This project will be conducted in the following steps. We will conduct a thorough review of existing literature, research papers, and algorithms related to stock trend prediction using machine learning. We will gather datasets from diverse sources, including financial databases, stock exchanges, and online repositories. The datasets should include historical stock prices, trading volumes, market indicators, and possibly other relevant features such as news sentiment or macroeconomic data. We will experiment with a variety of machine learning algorithms suitable for time-series forecasting and classification tasks. These may include but are not limited to Linear Regression, Support Vector Machines (SVM), Random Forest, Gradient Boosting Machines (GBM), and Long Short-Term Memory (LSTM) networks. We will then split the dataset into training and testing sets or employ cross-validation techniques to train and validate the chosen models. After implementation, we assess the predictive performance of the trained models on unseen data. Compare the results obtained from different algorithms and identify the most effective approach for stock trend prediction. Additionally, analyzes feature importance to gain insights into the factors driving stock movements.
Deployment and Monitoring.

Collaboration Plan:

1. **Literature Review and Background Study**
   - Task: Research and review academic papers “Stock Trend Prediction: Based on Machine Learning Methods” and “Stock Market Prediction Using Machine Learning”.
   - Leader(s): Fan Han Hoon
   - Deadline: 4/3/2024
   - Importance: Critical (a prerequisite for algorithm selection and data preprocessing)
   - Potential Challenges: Difficulty in accessing all relevant papers or understanding complex methodologies.
     Solution: Utilize university library resources and consult with the professor for explanations.
2. **Data Acquisition(DA) & Data Preprocessing(DP)**
   - Task: Acquire historical stock price data along with relevant financial indicators (e.g., volume, PE ratio) from public datasets. Then, our team would handle missing values, normalize/standardize data, and create training/test splits.
   - Leader(s): Da Teng and Jiacheng Zhang
   - Deadline: 4/6/2024(DA), 4/10/2024 (DP)
   - Importance: Critical (basis for all analyses and modeling)
   - Potential Challenges:
     (1) Issues with data quality or completeness.
     Solution: Source data from multiple reliable platforms and cross-validate.
     (2) Overfitting due to improper preprocessing.
     Solution: Apply cross-validation techniques and consult with a professor.
3. **Model Selection, Implementation, Evaluation and Optimization**
   - Task: Based on the literature review, select suitable learning models for stock price prediction using Python. Then, evaluate and optimize the performance of the implemented models using metrics such as accuracy, precision, recall, or specific financial performance measures.
   - Leader(s): Fan Han Hoon and Da Teng
   - Deadline: 4/19/2024
   - Importance: Critical
   - Potential Challenges:
     (1) The model may perform differently than expected due to the complexity of stock market data.
     Solution: Experiment with a combination of models and parameters.
     (2) Models might overfit or underperform on unseen data.
     Solution: Use techniques like cross-validation and regularization.
4. **Final Project Presentation Preparation and Project Writeups**
   - Task: Work on slides and a demonstration of the model predictions. Meanwhile, write the final project report, detailing the problem, methodology, results, and conclusions. Include sections on literature review, data preprocessing, model selection, results, and discussion.
   - Leader(s): Jiacheng Zhang and Fan Han Hoon
   - Deadline: 4/22/2024(Presentation), 4/30/2024 (Report)
   - Importance: Critical
   - Potential Challenges: The live project demonstration cannot run properly.
     Solution: Pre-record the demo video and play it during the presentation.

References

Song, Y. (2018). Stock Trend Prediction: Based on Machine Learning Methods. *UCLA*. ProQuest ID: Song_ucla_0031N_16607. Merritt ID: ark:/13030/m5zs7sqk. Retrieved from https://escholarship.org/uc/item/0cp1x8th

I. Parmar et al., "Stock Market Prediction Using Machine Learning," 2018 First International Conference on Secure Cyber Computing and Communication (ICSCCC), Jalandhar, India, 2018, pp. 574-576, doi: 10.1109/ICSCCC.2018.8703332.