Information Theory Project

1 Project Description

The project is an opportunity for you to explore the connection of information theory to the practical problem, Stock Market Analysis. The data can be found in https://cloud.tsinghua.edu.cn/d/410006a16f9147efaf43/, including the training data and stock information of the testing data. You have two specific tasks.

The first task is that you need to model with the training data to forecast the stock closing price of the testing data. In this scenario, information theory is not necessary. We will use the RMSE function to evaluate your prediction results.

Based on the analysis of the first part, the second task is that suppose you have 100,000 RMB initially, you need to design an automatic portfolio strategy to maximize stock profit with the training data at every minute. The strategy contains many aspects, such as what stocks to invest and when to invest. Besides, this part should involve information theory idea. The API will be released later to evaluate your investment strategy using the testing data.

Totally, the stock closing price prediction results for the first part and the automatic investment strategy for the second part should be provided to evaluate your algorithms. To simplify the analysis, we assume only the stock price information is considered, regardless of the market factor, trading volume, etc. All parameters and experiment condition should be set reasonably. Python or Matlab can be used for implementation.

2 Project Schedule

- Project Team: **Up to three students**
- Project Presentation(10 to 15 minutes): **About December 27, 2018**
- Project Report(about 5 pages): **Before January 6, 2019**

Team: Up to three students can team up to complete this project. Solo is allowed. All members of a team will have the same score.

Presentation: You will present the project to the professor and your peers. Your presentation should give a clear introduction about the problem formulation, highlights of analysis, algorithms and results. You should aim for a 10 minute talk plus $2-3$ minute questions and answer at the end.

Report: The report should cover the same topic and you should present it as completely as possible. Your can give the detail of the problem, analysis, algorithm and numerical results. The report length is about 5 pages. Please do not include codes in your report. All the codes should be submitted separately.

Your project will be graded mainly based on the tasks. Novelty will be highly rewarded. The organization, English usage, readability and clarity of the project report and presentation are also important and make up a part of the grade.

Plagiarism will not be tolerated.