11010COM525200 Financial Technology

Program HW2

Deadline: 12/13(Monday) 23:59

Grading Policy:

1. In the programing assignment, the code, data and report should be compressed into a **ZIP** file and upload to eeclass website. Also, please write a Readme file to explain how to run your code and discuss characteristics in your report. The report format is not limited.

2. The programming language that can be used on this assignment is Python. Built-in libraries or functions are allowed to use.

3. Discussions are encouraged, **but plagiarism is strictly prohibited.**

Problem:

1. Collect the TAIEX from 2012/12/01 to 2018/12/02 (Day Bar). The data should include open, close, high, low, volume.

2. Apply the triple-barrier method to label the collected data. The upper bound is set as 4% and labeled as 1 once it is touched. The lower bound is set as 2% and labeled as 2 once it is touched. The vertical barrier is set as 20 days and labeled as 0 once it is touched.

3. Use “close price” to calculate 8 technical indicators of collected data. The technical indicators are:
   A. Bios of moving average: 5-days, 10-days, 20-days, 60-day.

      ((價格-MA)/MA)

   B. RSI: 14

   C. MACD(快線 DIF), MACD signal(慢線), MACD histogram(柱狀)

D. Save problem 1, 2, 3 to a csv.

4. Use the collected data in problem 1 and all technical indicators in problem 3 to calculate the 2 PCA component.
   A. Plot the explained variance ratio and its cumulative sum.
   B. Plot data by class labeled in problem 2.
   C. Discuss pros and cons of PCA method in this dataset.