

AIFT

Midterm Project

Due April/16/2025

Problem 1 (50%)

- Fetch any five stocks, then **work out investment models to increase the return of your strategies.** Given an initial capital of \$10000 to invest for each stock, you have to come up with at least one method, such as moving average strategies, to see the investment performance of your models. Also, you need compare your own method with the lump-sum method and DCA. All the return of models must be presented at the annual rate of return.

- **Back-test your strategies.**

In time-series problems, typically in-sample data is used to train the model and out-of-sample data is used to test the performance of the trained model. The statistical validation (temporal validation) is as shown in the following table.

Temporal Validation (TV):

TV/Year	1	2	n
1	Training	Testing						
2							
...							
n-1							

One may use the data of the first several years to train the model, and the remaining data is used for testing. For instance, TV1 means the data of year 1 is used for training, and the data of years 2 through n is used for testing; TV2 means the data of years 1 through 2 is used for training, and the data of year 3 through n is used for testing. This setup is to provide a set of temporal validations to examine the effectiveness of the models for the dynamic characteristics in many financial applications, which is different from the regular cross-validation procedure where the process of data being split into two independent sets is randomly repeated several times without taking into account the data's temporal order.

In this project, be sure to use temporal validation, i.e., using the training/testing framework to systematically investigate your model.

Problem 2 (50%)

Use the five stocks you fetched from Problem 1 to implement a pairs-trading strategy, e.g., you may use the method employed in Paper 1 in Moodle. Make sure to use Temporal Validation (TV) to train and test your model.

Notice that for this problem, the goal is to see how you solve the problem, instead of asking you to work out a perfect model. The grades will be given based on your creativity and the complexity of your model, and the performance of the models you proposed.

For each group, please describe everyone's contribution to this project. The grades are calculated according to individual grade (個人分數 50%) and group grade (團隊分數 50%).

Finally, zip the files below and upload it to elearningv4:

- a) Source codes
- b) Word file containing the results, the discussions, including what you have learned
- c) Demo PPT file

Link: <https://elearningv4.nuk.edu.tw/>