

## AUA – Spring 2024 Time Series Analysis/Forecasting Homework 4

Use datasets “train.csv” and “test.csv” from e-learning AUA.

### Problem 1. Classification problem.

- a) **(score = 1)** Work with “train.csv”. Visualize time series and try to understand with features can be useful.
- b) **(score = 1)** Construct the features and apply different ML models to classify time series. Use scaling, pipelines, GridSearchCV and perform the fine-tuning of hyper-parameters.
- c) **(score = 1)** Validate the optimal models on “test.csv” via classification reports and confusion matrices.

### Problem 2. Clustering problem.

- a) **(score = 1)** Start with “train.csv”. Don’t use the labels. Perform clustering based on the features from the previous exercise. Suggest the number of clusters that you need.
- b) **(score = 1)** Use “test.csv” and assign observations across clusters. Think how to perform that assignment. Evaluate the accuracy of the clustering by remembering that the test observations have labels (some ground truth).