OMIS 3020

Homework Assignment 1

Deadline for handing in this case: Sunday October 23, 2022 at 11:59 pm.

Please take the following into consideration when handing in this case:

1. **This is an individual assignment!**
2. Use Python to answer the questions. You must submit your Python codes in two formats (i.e., ipynb and html formats). Additionally, you must prepare a two-page summary report highlighting main results and your key takeaways.
3. Summary report should be in the word format:
   (with the name: "OMIS_homework_summary.doc").
4. Accordingly, name the Python files as "OMIS_homework".
5. Create a ZIP-file containing the Python files and the summary report. Put your student number in the name of the ZIP-file. For example, the name of the ZIP-file becomes "123456.zip".
6. Submit the ZIP-file online on the Canvas

Questions

Part A

1. Download the "dataset_lm.csv" file from Canvas and upload it to Jupyter Notebook.
2. Run the OLS model by using the dependent and explanatory variables in the dataset.
3. Show your summary table in Python and interpret your results in the summary report.

Part B

1. Use error values from the OLS model to calculate their standard deviation and autocorrelation values for the first three lags.
2. Then, run the GLS model accordingly.
3. Show your summary table in Python and interpret your results in the summary report.

Part C

1. Split the dataset into two as the training and test sets (test size = 0.5).
2. Run the Lasso model with alpha=1 and estimate the coefficients using the training set.
3. Then, calculate the mean absolute percentage error using the test set.
4. Find an approximate value for alpha that minimizes the mean absolute percentage error.