FTEC5580 Project 2

Due 11:59pm, April 28, 2021

Instructions:

- Prepare a single Jupyter notebook (with code, results, your explanations and interpretations) and submit it in Blackboard. You CANNOT submit more than 2 times.
- Name your Jupyter notebook as "last name-first name-Project2". Please follow the naming convention strictly.
- You must work on the project independently.
- You can use only R as the kernel in Jupyter for the time series part and only Python as the kernel for the neural network part.
- If you submit your work late, please directly email it to the TA. Late submission incurs a penalty as specified in the syllabus. Submissions made two days after the deadline are not accepted.
- The TA responsible for grading this project is *DAI Zhiwen*.

You have been assigned a stock to analyze and its ticker can be found from the grade center. You can only analyze this stock.

1 Data

Download the price data of this stock from Jan 2, 2015 to Dec 31, 2020. Only consider the adjusted prices. Use the first five years of data for training your model and the last year's data for testing.

2 Tasks

(1) Develop a time series model and justify that it provides adequate fit to the price data. Use the trained model to predict the prices in 2020 and report the prediction MSE.

(2) Develop a feedforward neural network (FNN) model for the price data using the prices on the previous several days as inputs. Use the trained model to predict the prices in 2020 and report the prediction MSE.

(3) Plot the predicted results from these two models with the actual price path in 2020. Compare their prediction performances and discuss.

Note: In the prediction task, you make one-day rolling forecast. There is no need to retrain your model as you roll your forecast.