Assignment 1

Applied Forecasting in Complex Systems 2022

Week 2
November, 7, 2022

Background on how to work effectively on this assignment:

1. Follow the [Guideline of Assignment 1 to 2] in canvas.
2. Please explain all solutions, show the calculations and write down your foundations and reflections. When necessary, reduce your plot.

Use library(fpp3) to get the dataset unless specified as a file.

Exercise 1 (3 pts.)

The `aus_livestock` data contains the monthly total number of pigs slaughtered in Victoria, Australia, from Jul 1972 to Dec 2018.

1.1) (1 pt.) Use `filter()` to extract pig slaughters in Victoria between 1990 and 1995.

1.2) (1 pt.) Use `autoplot` and `ACF` for this data. How do they differ from white noise?

1.3) (1 pt.) If a longer period of data is used, what difference does it make to the ACF?

Exercise 2 (3 pts.)

For each of the following series, make a graph of the data. If transforming seems appropriate, do so and describe the effect.

2.1) (1 pt.) United States GDP from `global_economy`.

2.2) (1 pt.) Slaughter of Victorian "Bulls, bullocks and steers" in `aus_livestock`.

2.3) (1 pt.) Gas production from `aus_production`.

Exercise 3 (4 pts.)

For the Australian takeaway food turnover (`aus_retail`), use `filter(Industry == "Takeaway food services")`

3.1) (2 pt.) Create a training set by withholding the last four years as a test set.

3.2) (1 pt.) Fit all the appropriate benchmark methods to the training set and forecast the periods covered by the test set.

3.3) (1 pt.)Compute the accuracy of your forecasts. Which method does best? Do the residuals from the best method resemble white noise?