

22/23

THE UNIVERSITY OF HONG KONG
DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE
STAT4601 Time Series Analysis
Project

1 Guidelines for the project

Find a time series with sample size $n > 100$, and delete the last 5 values for the sake of comparison at the end of this project. Answer the following questions one by one, and some software will be needed to derive the answers.

1. Introduce briefly the background of this time series. ✓
2. Draw the time plot, and check whether or not it is stationary and whether or not it needs transformations. ✓
3. Transfer this time series into a stationary sequence if possible. Specify the reasons to your action. ✓
4. Specify the model(s) based respectively on sample ACFs, and on the sample PACFs. ✓
- ★ 5. For each specified model,
 - ✓ (a) estimate the parameters by the maximum likelihood estimation method or others.
 - ✓ (b) use Ljung-Box test to check the fitted model is adequate or not. Please try several different K here. ✓
 - (c) use overparameterized method to check the adequacy of the fitted model.
 - (d) suggestion some alternative models if the fitted model is not adequate.
 - (e) check these alternative models.
6. Use AIC to select one model if there are more than one adequate models.
7. Forecast the 5 future values, and compare them with the true values.
8. Any new insight into this time series based on the above process?

Note: the above listed items are ONLY for your reference, and you do not need to exactly follow them (except the requirement on sample sizes).

2 Regulation

1. This is a group project, and each group has 3-5 students. Please try to form the groups by yourself, and send your member list to me and tutors as soon as possible or at least before November 10, 2022. We will randomly assign you to a group if you cannot find a group before that.
2. Each group needs to submit a **report**, and a **presentation** will be needed at the **last teaching week**. I am still thinking about the marking rule, and will let you know soon.
3. Please submit the percentages of contributions of each member within your group.

Note: this is a tentative method for your evaluation on project, and we may do slightly revision according to agreements with the majority of the students in this course.