

Homework 8

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Instructions:

The weekly assignment serves two purposes: (1) Extend the materials taught in the asynchronous materials; some new concepts or techniques are introduced in the weekly assignment. (2) Ensure that you have learned the concepts, techniques, theories, statistical models covered in a specific week. Below are some guidelines:

- Submit 2 files. Missing one of the two files will result in a 50% reduction in grade.
 1. A report (in pdf format) detailing your answers and all the steps to arrive at your answers
 2. A well-documented R-script, jupyter notebook, or Rmd file detailing all of the codes used to arrive at your answers.
- Late submission will not receive any credit.
- All the steps used to arrive at your final answers need to be shown clearly. These steps are as important as the final answer.
- The final answer of each question needs to be very easy identified; the use of bold fonts, highlights, or circling will help.
- This is a group project. Form a group with 3 or 4 people.
- Although this is a group project, we encourage you to attempt all of the exercises before discussing with your teammates. Do not use the “division-of-labor” approach. Each of the students in a group is expected to make sufficient contribution to the lab. If any of your teammate does not make sufficient contribution, please contact your instructor.
- **DO NOT copy and paste or even leverage on the solutions we gave to the students in previous semesters. Violation will be reported to the Director of the MIDS program and the Office that oversees UC Berkeley Academic Integrity. In any case, the lab has various subtle changes that make those answers not directly applicable.**

Build an univariate linear time series model (i.e AR, MA, and ARMA models) using the series in hw08_series.csv.

- Use all the techniques that have been taught so far to build the model, including date examination, data visualization, etc.
- All the steps to support your final model need to be shown clearly.
- Show that the assumptions underlying the model are valid.
- Which model seems most reasonable in terms of satisfying the model's underlying assumption?
- Evaluate the model performance (both in- and out-of-sample)
- Pick your “best” models and conduct a 12-step ahead forecast. Discuss your results. Discuss the choice of your metrics to measure “best”.