Homework Chapters 5 (STA 5015)

Reading: Chapter 5

1. Problem 5.1
2. Problem 5.3
3. Open the data in `"mysterious.txt"` and perform the following analysis.
   (a) Draw time, SACF and SPACF plots and briefly describe their features. Which order of ARMA(p, q) model is plausible?
   (b) For the ARMA(p, q) model selected in (a), estimate parameters by YW and MLE.
   (c) Find the best ARMA(p, q) model in terms of AICc and perform test of randomness for the residuals. Also test whether coefficients are away from zero.
   (d) Produce 10-step ahead forecasts together with 95% prediction interval.
4. Open the data set in `"wind.txt"` and perform the following analysis.
   (a) Draw time, SACF and SPACF plots and briefly describe their features.
   (b) Find the best Box-Cox transformation stabilizing heteroscedascity. For example, you can check QQ-plot for heteroscedascity.
   (c) After you take transformation in part (b) (if you think it is not necessary, you just take it as identity transformation), find the best ARMA(p, q) model in terms of BIC. Also test whether coefficients are away from zero.