Statistics 565 Applied Time Series Analysis Spring 2019

Homework 8

Due: Wed 05/08/19 @ 6:00pm rutgers.instructure.com/courses/21204

1. Identify the following as certain multiplicative seasonal ARIMA$(p,d,q) \times (P,D,Q)_s$ models. That is, specify p, d, q, P, D, Q and s, as well as their associated ARIMA coefficients.
   (a) $Y_t = 0.5Y_{t-1} + Y_{t-4} - 0.5Y_{t-5} + e_t - 0.3e_{t-1}$.
   (b) $Y_t = Y_{t-1} + Y_{t-12} - Y_{t-13} + e_t - 0.5e_{t-1} - 0.5e_{t-12} + 0.25e_{t-13}$.
2. Problem 10.9. Please note: the data is actually in the file named `airpass`, from the `TSA` package.
3. Problem 10.9 continued:
   (a) Plot the periodogram of the series used in 10.9(c).
   (b) Revisiting the fitted model in 10.9(e): what seasonal ARMA model is implied of the series in 10.9(c)? Plot the theoretical spectral density of this seasonal ARMA model, using the fitted coefficient values as if the theoretical true values.
   (c) How do the two plots above compare to each other?
4. Problems 13.13, 13.17, and 13.21.
5. Problem 12.9, all parts except (c).