Assignment 11 Chapter 8 Model diagnostics

8.6 Simulate an AR(2) model with $n = 48$, $\phi_1 = 1.5$, and $\phi_2 = -0.75$.

(a) Fit the correctly specified AR(2) model and look at a time series plot of the residuals. Does the plot support the AR(2) specification?

(b) Display a normal quantile-quantile plot of the standardized residuals. Does the plot support the AR(2) specification?

(c) Display the sample ACF of the residuals. Does the plot support the AR(2) specification?

(d) Calculate the Ljung-Box statistic summing to $K = 12$. Does this statistic support the AR(2) specification?

8.11 Exhibit 6.31 on page 139, suggested specifying either an AR(1) or possibly an AR(4) model for the difference of the logarithms of the oil price series. (The filename is oil.price).

(a) Estimate both of these models using maximum likelihood and compare the results using the diagnostic tests considered in this chapter.

(b) Exhibit 6.32 on page 140, suggested specifying an MA(1) model for the difference of the logs. Estimate this model by maximum likelihood and perform the diagnostic tests considered in this chapter.

(c) Which of the three models AR(1), AR(4), or MA(1) would you prefer given the results of parts (a) and (b)?

Deadline: Nov 23 (Tuesday) 2021 before class