

STAT 496  
Homework 7 Problems  
due Wed. November 7

4 Problems. Show all work.

Please follow the Lab report directions off the homework web page for R Problems. Please work in HW Groups! **You should be using Sweave and R Studio to create a pdf! Please upload your pdf document on Blackboard.**

1. p. 103, 5.7 (a) (omit (b) and (c))

In addition for model B: Use the R function `arima` to simulate a time series of length  $n = 500$ . Use the R `set.seed(7)` function. Make a time series plot of the data, sample ACF plot, and sample PACF. (See the Lab.) Make a time series plot of the differenced data, sample ACF plot, and sample PACF. (See the Lab.) From your plots of the data, what model would you fit to the data?

2. Let's consider the ARIMA(1,1,0) model with  $\phi_1 = 0.8$ . Use the R function `arima` to simulate a time series of length  $n = 500$ . Use the R `set.seed(7)` function. Make a time series plot of the data, sample ACF plot, and sample PACF. (See the Lab.) Make a time series plot of the differenced data, sample ACF plot, and sample PACF. (See the Lab.) From your plots of the data, what model would you fit to the data?

3. p. 190, 8.9: Note: Fit each model with the `arima` function with the default method (`method="CSS-ML"`).

To diagnose each of fit, use the `tsdiag` function. It will give you 3 diagnostic plots. Also include the normal Q-Q plot of the residuals and use the `qqnorm` and `qqline` functions.

Don't forget to compare the two fits.

In addition, what are the AIC values for each of the two fits. Which one has the smallest AIC?

4. p. 190, 8.11: Note: Fit each model with the `arima` function with the default method (`method="CSS-ML"`).

To diagnose each of fit, use the `tsdiag` function. It will give you 3 diagnostic plots. Also include the normal Q-Q plot of the residuals and use the `qqnorm` and `qqline` functions.

Don't forget to compare the three fits.

In addition, what are the AIC values for each of the three fits. Which one has the smallest AIC?