STAT 496
Homework 4 Problems
due Wed. October 26

5 Problems. Show all work.
Please follow the Lab report directions off the homework web page for R Problems. Please work in HW Groups!

Indicate the leader for each problem.

1. Consider the following MA(1) model:

$$Y_t = e_t - 0.6e_{t-1}$$

where $\{e_t\}$ is a mean zero white noise process with constant variance σ_e^2.

You have already calculated and the ACF for $k = 0, 1, 2, 3, 4, 5$ lags for Homework 3 Problem 2 (a). Now, calculate the PACF ϕ_{kk} by hand for $k = 0, 1, 2$ lags. (You can check your calculations by using the R function ARMAacf with the pacf=TRUE option.) You do not need to sketch the the PACF. Note: By convention $\phi_{00} = 1$.)

2. p. 172: 7.13.
Use the R set.seed(1) for the first simulation and the set.seed(2) for the second simulation
(a) Use the R function ar.
(b) Use the R function arima with the method argument method="CSS".
(c) Use the R function arima with the default method argument method="CSS-ML" .

3. Repeat Problem 2: p. 172: 7.13, but use a sample size of n=500.

4. p. 172: 7.16.
Use the R set.seed(1) for the first simulation and the set.seed(2) for the second simulation
(a) Use the R function ar.
(b) Use the R function arima with the method argument method="CSS".
(c) Use the R function arima with the default method argument method="CSS-ML".

5. p. 174: 7.26.
(a) Use the R function ar.
(b) Use the R function arima with the default method argument method="CSS-ML"
In addition, use your fit from (b) and the R tsdiag function to make 3 diagnostic plots of the fit. Examine the the first 2 plots. Does it look like the residuals are indeed independent and identically distributed (iid)?