EXERCISE 5

Purpose: To learn how to use the **sample autocorrelation function** and **sample partial autocorrelation function** as well as the **P-Q Box** to help determine the **best** Box-Jenkins model for the Lead Production data. Also we will use the estimation of **overfitting models** and the **significances of the overfitting coefficients** to further confirm our choice of the **best** Box-Jenkins model for the Lead Production data. This homework is due **Thursday, September 29.**

Download the SAS program **LeadProd_P-Q_Box.sas** from the Eco 5375 class website (in the exercises subdirectory) and add the necessary commands to complete the rest of this exercise.

(i)   Print out and hand in with this exercise the ACF and PACF of the lead production data and a plot of the data. Make **a tentative choice** of p and q for a Box-Jenkins model of the data. Thoroughly explain your reasoning. Consult the document ACF_PACF_Table.doc or ACF_PACF_Table.pdf.

(ii)   Complete the below P-Q Box. (a total of 6 cells). You can assume the data is already stationary. Given the statistics that you report, which model do you prefer? Explain your reasoning. For information, see Stats.pdf on the course website.

Q

		0	1	2
	0			
P	1			
	2			

(iii)   Conduct overfitting exercises for the model preferred by the P-Q Box.

        Overfitting Model 1 is ARMA(___,___).
        The overfitting coefficient is _____.
        The T-statistic of the overfitting coefficient is _____.
        Therefore the overfitting coefficient from this model is
        statistically (significant/ insignificant). Circle one alternative.

        Overfitting Model 2 is ARMA(___,___).
        The overfitting coefficient is _____.
        The T-statistic of the overfitting coefficient is _____.
        Therefore the overfitting coefficient from this model is
        statistically (significant/ insignificant). Circle one alternative.

(iv)   Given all of the above results what is your final choice for p and q?

        p = _____   q = _____.

        In the below space, write out the final chosen model in both "deviation-from-mean" form and "intercept" form.