

EXERCISE 7

Purpose: To learn how to use build a **multiplicative seasonal Box-Jenkins model** for the Plano Sales Tax Revenue data and use the model to predict the total sales tax revenue for 2006 for the Plano City manager. **You are to hand in this exercise on Monday, November 9.**

Download the program Plano_Multiplicative_BJ.sas from the class website and use it to complete the following tasks. (Note: You will need to add “maxit=1000” to the PROC ARIMA estimation statements for the second, third, and fourth models below in order to get the estimation process to converge.)

- (i) Fill in the below table:

d = ____, D = ____.

p	q	P	Q	AIC	SBC	p-value of Chi(lag=24)
0	0	0	0	_____	_____	_____
0	1	0	1	_____	_____	_____
1	0	1	0	_____	_____	_____
1	1	1	1	_____	_____	_____
p=(24) q=(1,2,3)(12)				_____	_____	_____

Using the AIC and SBC goodness-of-fit measures, and the p-value of the Chi-square test for white noise in the residuals of the fitted model, which of the above models do you prefer? (Note: You should, in addition, check to see if the coefficients of the model you choose are all statistically significant, apart from the mean (μ) possibly. Explain your answer.

- (ii) Using your preferred model of choice, forecast the Plano Sales tax revenue data for December 2005 and all of 2006. Report your point forecasts and their confidence intervals below:

Months	Monthly Forecast	95% Confidence Interval
Dec. '05	_____	_____
Jan. '06	_____	_____
Feb.	_____	_____
Mar.	_____	_____
Apr.	_____	_____
May	_____	_____
June	_____	_____
July	_____	_____
Aug.	_____	_____
Sep.	_____	_____
Oct.	_____	_____
Nov.	_____	_____
Dec.	_____	_____

(iii) I want you to complete the following statements for the Plano City Manager.

“Using the Multiplicative Seasonal Box-Jenkins model, I am projecting that the Total Sales Tax Revenues for the City of Plano in 2006 will be _____ for 2006. Furthermore, I am projecting that the 2006 revenues will be _____ % higher than they were in 2005.” Show your calculations below.