ECO 5375-701   Prof. Tom Fomby
Eco and Bus Forecasting   Fall 2016

EXERCISE 3
KEY

Purpose: To **write a SAS program** that will fit a **Deterministic Trend/ Deterministic Seasonal Model** to the Plano Sales Tax Revenue data and that will **forecast** sales tax revenue for the Plano City Manager through December of 2006. You are to hand in this exercise in class on Tuesday, September 27.

Download the program Plano_Forecast.sas from the class website. You are to use it to answer the following parts of this exercise.

a) As you will recall our discussion in class we are going to be working with the sales tax revenue data straight away and without logarithmic transformation. (As it turns out, a formal statistical analysis of whether we need to take the log of the data or not indicates that we don't need to take the log transformation of the data. Instead we can use the data as is.) Use the Plano_Forecast.sas program to fill in the following blanks.

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

Forecasts of Plano Sales Tax Revenues for December 2005 through December 2006
Produced by Deterministic Trend / Deterministic Season model with AR(1,3,5,8,10,12) errors
p_ar = point forecasts, l_ar = lower 95% cl, u_ar = upper 95% cl

Obs	p_ar	l_ar	u_ar	t
1	3775377.88	3351893.34	4198862.43	191
2	3979570.27	3546095.74	4413044.81	192

Obs	p_ar	l_ar	u_ar	t
3	6336818.37	5902683.84	6770952.91	193
4	3948167.01	3453927.33	4442406.68	194
5	3801259.29	3296213.98	4306304.59	195
6	5478223.43	4952002.58	6004444.28	196
7	4205693.15	3648153.42	4763232.88	197
8	4067607.40	3500012.19	4635202.61	198
9	5537276.80	4964609.24	6109944.35	199
10	4240080.40	3653843.94	4826316.85	200
11	4248270.10	3660594.94	4835945.25	201
12	5623919.83	5035169.64	6212670.02	202
13	4142704.60	3516451.08	4768958.12	203

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

 "Using the Deterministic Trend/Seasonal model (with autocorrelated errors), I am projecting that the Total Sales Tax Revenues for the City of Plano in 2006 will be __**55,609,591**_____ for 2006. Furthermore, I am projecting that the 2006 revenues will be __**5.494%**_____ % higher than they were in 2005." Show your calculations below.

Answer: The sum of the projected revenues for 2006 (Forecasts 2 – 13) = 55609591. The sum of the 11 known revenue numbers (January – November of 2005) = 48938124. The projected number for December 2005 is 3775378. Therefore, for the 2005 revenue we can use the number 48938124 + 3775378 = 52713502. The per cent increase in the Plano sales tax revenues from 2005 to 2006, as projected by the DTDS model is

100*(55609591 – 52713502)/52713502 = 5.494%.