Second Exam

Write all answers in your blue book and show all work there. Return your exam and printout(s) in your blue book.

35 pts.

1) Consider this small set of data for variables A, B and C. Do this work by hand and show your work.

A(1000's)	B	C
1	3	7
2	5	6
3	5	4

a) Fit a regression line where B is a function of A.

b) Find the r^2 for your line and interpret it.

c) Use the model to predict B when A is 3000.

d) Find the adjusted r^2 for your model and interpret it.

e) Given that s_b is .577, do you find A to be a significant variable? Let $\alpha = .05$ and show all steps to the test

f) Find the s_{yx}.

g) Find the leverage of the first observation.

h) Construct a 95 percent confidence interval for μ_{BA} when A is 1 thousand (as in the first observation).

15 pts.

2) **Computer problem. Write your answers on your printout.**

a) Use the computer to try a simple linear model on these data, TC = a + bQ. Be sure to ask for a scatter plot of either the original data or the residuals.

Q	TC
1	10
2	12
3	16
4	22
5	31

b)   Try another model that your assessment of the residuals suggests might fit better. What do you see in the second model's results that suggests that it fits better than the first one?

30 pts.

3) **Computer Problem. Write your answers on your printout.**

a) Open the Cars file in the Chapter 16 folder with SPSS.

b) Set up a model where the miles per gallon in the city (cty) is a function of the number of cylinders (cyl), engine displacement (displ) and transmission type (type; you need to recode here. If you need help, ask, but it will cost you points). Before you run the regression, look over the question below and ask the computer to do all the things that you require.

c) Which of the variables are significant (α = .05). Why? (You don't need all the formal test steps.)

d) Check for two econometric problems. Indicate what kind of problems you are looking for and interpret the results there on the print out.

20 pts.

4) Consider the printout below.

a) Write the regression equation using the symbols and coefficients from the printout.

b) Does this model have a constant percentage rate of growth? Explain.

c) Interpret the Durbin Watson statistic (answer without using the table).

d) Examine the scatter plot for econometric problems. There are two reasonable ways interpret what you see. Give two.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.998[a]	.996	.996	105.972497611414	.020

a. Predictors: (Constant), time
b. Dependent Variable: y

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.5E+008	1	245412557.2	21852.969	.000[a]
	Residual	932104.1	83	11230.170		
	Total	2.5E+008	84			

a. Predictors: (Constant), time
b. Dependent Variable: y

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	280.815	23.193		12.108	.000
	time	69.253	.468	.998	147.827	.000

a. Dependent Variable: y

Scatterplot

Dependent Variable: y

y
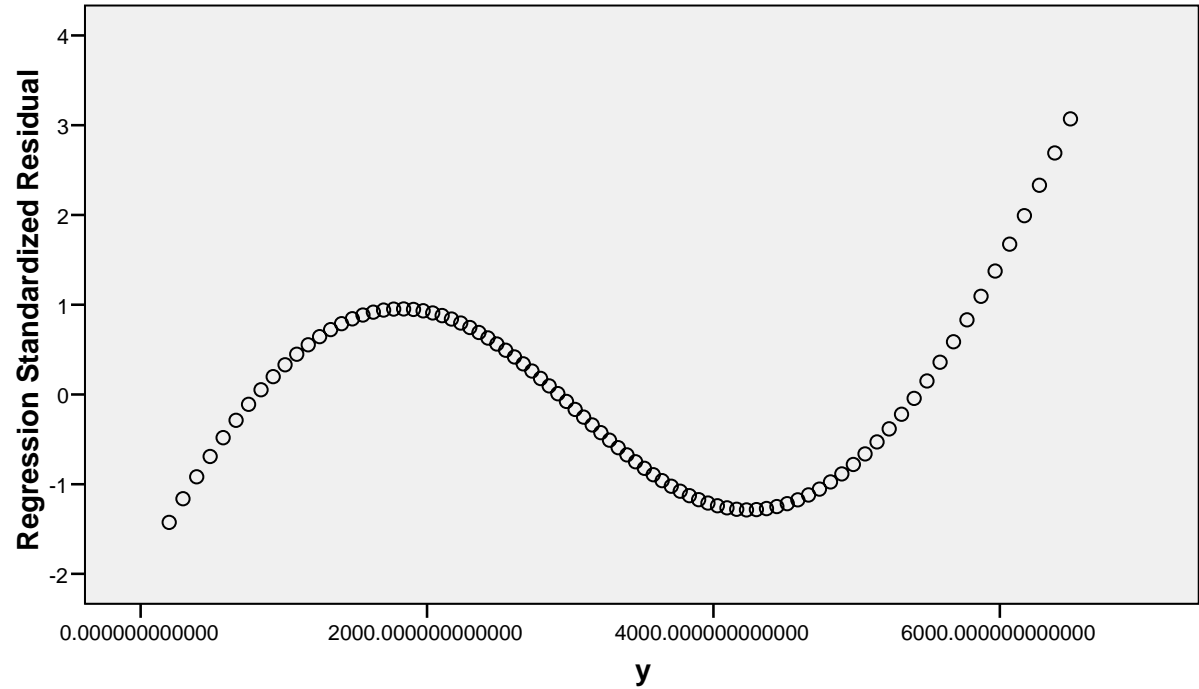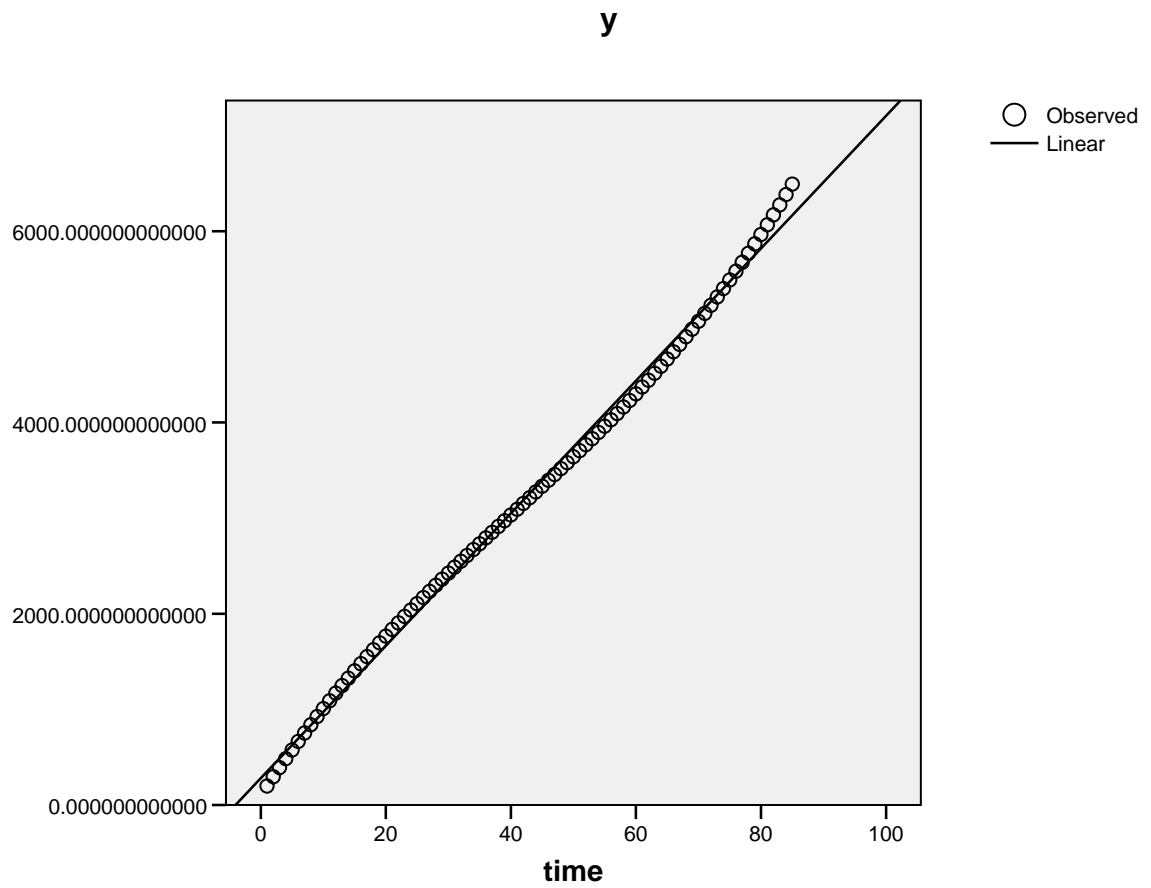
I have neither given nor received unfair aid on this test nor am I aware of anyone else who has.

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