Stat 2216 Spring 2004

Statistical Methods R. Claycombe

Second Exam

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

30 pts.

1) Consider the following data.

A	B	C
6	9	1
7	8	2
4	7	3
3	6	3

a) Calculate the regression function where A is a function of B.

b) Calculate the predicted value for A, given B = 8.

c) Calculate the correlation coefficient and test for its significance. ($\alpha = .01$)

d) Calculate the confidence interval for $\mu_{A.B}$ given B = 8. ($\alpha = .05$) (SAVE TIME WITH $s_{a.b}=1.183$)

e) Calculate the standardized residuals and make a plot. (SAVE TIME WITH $h_1=h_4=.45$ and $h_2=h_3=.3$)

f) Are there any outliers or influential observations? Why?

15 pts.

2) a) Use the data in question 1 to estimate a multiple regression where A is a function of B and C. Use the normal equations.

b) Compare the effect of B in 2a to what you found in 1a and explain why it does or does not differ much between the two regressions.

20 pts

3) Consider the following regression output.

a) How much of the revenue's variation is explained by the model?

b) Where in the results do you see statistically significant relationships? ($\alpha = .05$)

c) Does collinearity seem to be a problem? Explain.

d) Do you see evidence of any other econometric problem. Why?

Regression

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Locations, Cars[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Revenue

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.970[a]	.942	.932	207.729

a. Predictors: (Constant), Locations, Cars

b. Dependent Variable: Revenue

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8342186	2	4171093.201	96.662	.000[a]
	Residual	517816.9	12	43151.406		
	Total	8860003	14			

a. Predictors: (Constant), Locations, Cars

b. Dependent Variable: Revenue

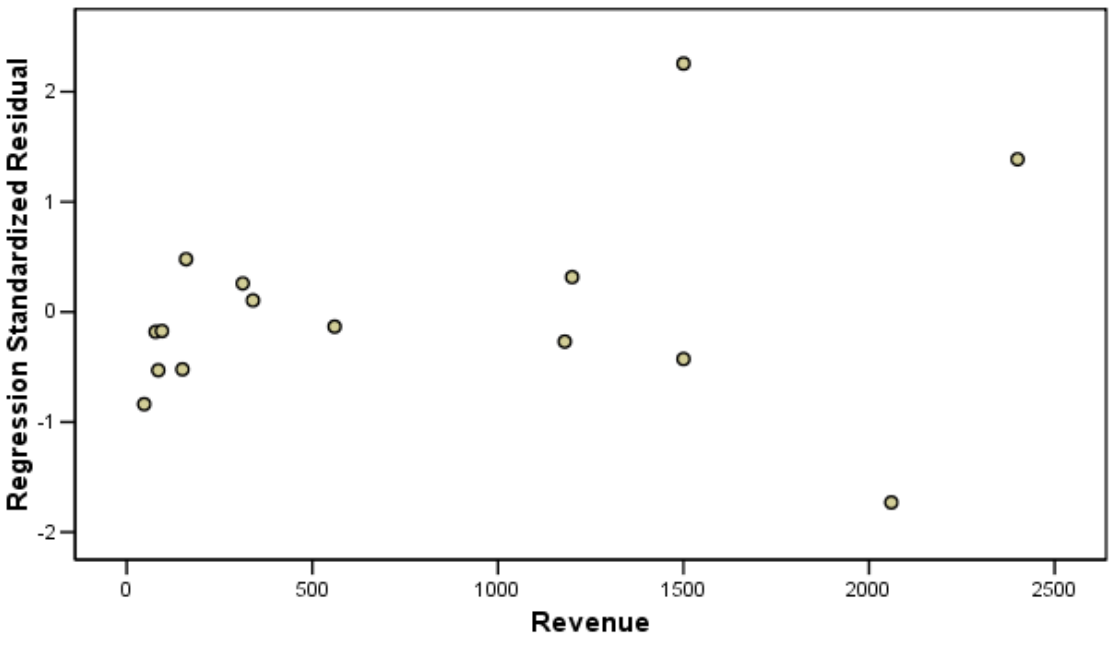
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	105.973	85.517		1.239	.239		
	Cars	8.943	.775	1.077	11.545	.000	.560	1.787
	Locations	-.191	.103	-.174	-1.865	.087	.560	1.787

a. Dependent Variable: Revenue

Scatterplot

Dependent Variable: Revenue



35 pts

4) Computer Problem (print all your results and attach)

Use the Beer data from Chapter 16 for this question.

a) Estimate an equation where Shipments = $a + b_1 Exp + b_2 Exp^2$.

b) Do you find a significant relationship in part a? Explain.

c) Create a dummy variable that identifies brands that begin with B.

d) Reestimate the model in part a with the dummy variable added.

e) Is the dummy variable a valuable addition to the model? Why?

f) Reestimate the model with one of the variables in part d omitted. Omit the one that should be omitted.

g) Draw a well-labeled diagram of the equation you got in part f.

h) Is the part f model the best one for these data? Why?

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

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