

DSC 330 – Final Exam Short Answer Sample Questions

Instructions: Write your answers in the spaces provided. Anything that appears outside the spaces will be IGNORED in grading. You might want to use a pencil so that you can make corrections easily. Some of the questions ask you to use numbers different to those in the “Preparation for Final Exam”. Read all numbers CAREFULLY!

1. See top of page 5.

The first multiple regression model fit included X1, X2, D3, D4, D5, and D6. Briefly explain why the variable RANK (1 = low-level, 2 = mid-level, 3 = senior) was *not* included in the model.

2. See bottom of page 6.

a) The nested model F-test used to see if the 2 interaction terms D6X1 and D4X2 would be useful resulted in a nested model F-statistic of 1.243. This was based on residual sums of squares (sums of squared errors) of 0.244 for the reduced model (model 4) and 0.232 for the complete model (model 3). What would the F-statistic have been if instead the residual sums of squares had been 0.3 for the reduced model and 0.2 for the complete model?

F =

b) Suppose the complete model for this nested model F-test is written: $E(\log Y) = b_0 + b_1 X1 + b_2 X2 + b_3 D3 + b_4 D4 + b_5 D5 + b_6 D6 + b_7 D6X1 + b_8 D3X2 + b_9 D4X2 + b_{10} D5X2$. Write down the null hypothesis being tested.

NH:

3. See page 7.

a) What is the only interaction term remaining in model 5?

b) Briefly describe how including this term allows ranks of managers to be modeled differently. (For example, including a D4X1 interaction term in the model would allow the effect on logY of the number of years in current rank to differ for men and women – write a similar sentence that includes the interaction term you identified in part a.)

4. See page 11.

a) What is the p-value for the test of global usefulness of the model?

b) Does the result of this test mean that all the predictors in the model are useful?

Yes / No (select one by circling the correct response)

c) Explain your answer to part (b).

5. See page 11, “Coefficients” table.

a) The CEO of ACME Corporation believes that managers with MBA degrees are being paid more than those with Bachelors degrees, all other things being equal. Let the regression parameter for D3 in model 5 on page 11 be b_3 . Write the null and alternative hypotheses the CEO wishes to test:

NH:

AH:

b) What is the p-value for this test?

c) Does it appear that the CEO is correct? (use a significance level of 5%)

Yes / No (select one by circling the correct response)

d) Briefly explain your answer to part (c).

6. ACME Corporation hopes to hire someone as a senior manager. Their first choice is a woman who got their MBA 35 years ago and who has been a senior manager at a similar company for 25 years. Human resources would like to use your final regression model to predict her salary. Explain why this is not a good idea.