BUS 310, Quiz #3, Summer 2019 Name KEY

Instructions: This quiz is to be completed entirely in class. You may not use cell phones, and you may only access internet resources you are specifically directed to use. Go to Blackboard and open the data file posted under Quiz #3. Use it to answer the following questions. Place your answers to the bolded questions directly on this page. (If you do not answer questions on this page, they will not be graded.)

1. In the Quiz #3 data file, Sheet #1 shows a set of data relating advertising dollars and units sold for a particular product, the log of both original x and y variables are also shown. Created from the data, and the manipulated data are two scatterplots. The one on the left displays the original data with three different algebraic models for the data. The one on the right is built from the log data, algebraically equivalent to the best model from the graph on the left. The sheets #1-1 and #1-2 show the full regression analysis for the straight-line linear model for the original data and the log-log model respectively. **Describe your analysis below. Which is the better model and why? Discuss the model R^2 values, the residual graphs included, P-values, etc. Be as thorough as possible.**

The exponential model is the best, though it is not that different from the log model, both are clearly better than the linear model. The p-value of the model is much smaller and the residual graph is less problematic.

2. Use the data on Sheet #2 to find a multiple regression equation to predict stock price from average equity and annual dividend rate. **Report a confidence interval for the slopes of both variables and the adjusted R^2 value.**

95% RAE (0.07375, 08787)
ADR (9.299, 13.089)
adjusted R^2 = 0.9174

3. Using the same data as #2, construct a residual plot of the data. **Do the residuals satisfy the equal variance assumption? Are there any outliers?**

Yes, the appear to satisfy that assumption
there are no outliers

4. Using the same data as #2, conduct a hypothesis test on the model. **State the model null and alternative hypothesis, test-statistic and p-value.**

H_0: all $\beta_i = 0$ H_a: at least one $\beta_i \neq 0$
$F = 84.31$ P-value: $3.598 \times 10^{-8} < .05$ reject null
Some variable in model is predictive

5. Using the same data as #2, **predict the value of stock price if return average equity is 15.0 and annual dividend rate is 2.25. Construct a prediction interval around your value.**

$\hat{y} = 22.38$ 95% PI (18.76, 26.00)

Submit your completed Excel file to Blackboard, and submit your paper quiz to your instructor in class.