BUS 310, Quiz #3, Fall 2018

Name KEY

Section _____

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**. You must submit the Excel file you used to perform calculations into the Quiz #3 folder in Blackboard, and submit the paper version of the quiz to the instructor to be eligible to receive full credit.

1. The data on sheet #1 represents mpg ratings for 4 different car models. Conduct an ANOVA test to determine whether all the car models have the same mpg ratings or not. Confirm your results with a comparative boxplot. **State the null and alternative hypotheses, test statistic and P-value. State the conclusion of the test.**

H_0: all means are the same
H_a: at least one mean is different
F: 31.506 P-value: $5.886 \times 10^{-10} < .05$ reject null
MPG's do change by car model

2. Considering the test scenario above, **explain the meaning of a Type I and Type II error in the context of the problem.**

Type I error is that the means are the same, but we conclude that they are not.

Type II error is that the mean mpgs are not the same but we conclude there is not enough evidence to prove it.

3. The data on sheet #3 represents data for boiler maintenance hours depending on boiler capacity and pressure. Run a regression model to predict worker hours from the other two variables. Conduct a hypothesis test on the variable for pressure in this model. **State the null and alternative hypotheses, test statistic and P-value. State the conclusion of the test. What can you conclude about the predictive power of pressure on the worker hours? What would be the next step in your analysis?**

H_0: $\beta_{press.} = 0$
H_a: $\beta_{press} \neq 0$

T: 0.449 P-value = 0.656 > .05 fail to reject null
∴ should not include pressure in model since $\beta_{press} = 0$
predictive power of pressure not statistically significant.

Next step is to removed pressure variable from model and rerun regression analysis.

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