

Name Jerry

Student Number \_\_\_\_\_

## STA 441s 2020 Quiz 10

These questions refer to your analysis of the auto repair data.

1. (4 points) You fit a model with just one explanatory variable – maintenance program.

(a) You tested whether maintenance program affects repair rate. Please fill in the table below. On your printout, circle the  $F$  statistic and write "Question 1" beside it.

| $F$ Statistic<br>(a number) | $p$ -value   | Reject Null Hypothesis?<br>(Yes or No) | Statistically Significant?<br>(Yes or No) |
|-----------------------------|--------------|----------------------------------------|-------------------------------------------|
| 17.45                       | $p < 0.0001$ | Yes                                    | Yes                                       |

(b) With or without a Bonferroni correction, one of the comparisons was not significant and the other two were. State which one <sup>pairwise</sup> ~~it~~ was and give the <sup>not significant</sup> uncorrected  $p$ -value.

One vs two,  $p = 0.6194$

(c) In plain, non-statistical language, what do you conclude? <sup>From the pairwise comparisons</sup> No marks for this without the other parts right.

With maintenance programs one and two, there was less chance of needing a repair.

2. (2 points) You fit a model with maintenance program, month, (re-scaled) total customers and (re-scaled) total kilometers as the explanatory variables. You tested month controlling for maintenance program, total customers and total kilometers. Fill in the table below. On your printout, circle the  $F$  statistic and write "Question 2" beside it.

| $F$ Statistic<br>(a number) | $p$ -value | Reject Null Hypothesis?<br>(Yes or No) | Statistically Significant?<br>(Yes or No) |
|-----------------------------|------------|----------------------------------------|-------------------------------------------|
| 0.35                        | 0.9727     | No                                     | No                                        |

The  $F = 37.78$  was for a model with just month and maint. program.

3. (4 points) The last model you fit had just maintenance program and rescaled cumulative kilometers as the explanatory variables. Based on this model, you estimated the probability of repair for each maintenance program, holding kilometers driven constant at the common mean number of kilometers at 6 months. Write the estimates below. On your printout, circle the numbers and write "Question 3" beside them.

Program 1 0.06141

Program 2 0.05965

Program 3 0.1288

Combine a scan of your quiz paper, your log file and your results file in one pdf document. Make sure your name and student number appear on the front page. Email to Amin at amin.kharaghani@mail.utoronto.ca before 8 p.m. on Monday March 23d.