Test 2 Corrections – Oliver Clackson, 11:30 section

Question 1:

a and d.

Question 2:

b and c.

Question 4:

a, b, and d.

Question 6a:

I would select model 3. Model 3 provides the largest coefficient of determination of determination ($R^2 = .8853$) of the three models, and, in addition, has all its predictors as statistically significant when each coefficient is utilized in a t-test for slope. Furthermore, model 3 demonstrates sufficiency in the conditions for constant variance, normality, a mean of 0, and linearity in its residuals.

Question 7a:

Perform a T-test for slope.

H_0: $\beta_2 = \beta_3 = 0$

H_A: either β_2 or $\beta_3 \neq 0$

Where β_2 represents the average change in mpg when transmission changes from manual to automatic and β_3 represents the average change in the effect of weight when transmission changes from manual to automatic.

Question 7b:

The reliability of each of these tests is dependent on their sufficiency regarding each of the assumptions needed to engage in linear regression: linearity, constant variance, normality, a

mean of zero, independence, and random selection within the residuals which estimate the model error. The reduced model with which we are performing the nested F-test does not demonstrate sufficient linearity or constant spread in its residuals. The full model with which we are performing the t-test, however, meets both these conditions. As such, the t-test is more reliable.