Assignment 1, 34 Marks
DANA 4810
Fall 2022, Due: October 10

Please include your RStudio output and codes to support your answers

Consider question 3.46 form the textbook and the data set: SNOWGEESE.

1) [1] List the variable(s) of interest in this study along with their types, list of categories, unit of measurements when appropriate. (Note: To identify how many categroies and what categories the categorical vaiable(s) have, use an R code.)

2) [1] Create a scatterplot and describe a possible relationship between weight change and digestion efficiency.

3) [1] Calculate the coefficient of correlation relating weight change to digestion efficiency. Interpret this value.

4) [7] Conduct a test to determine whether weight change is correlated with a digestion efficiency. Use $\alpha = .01$. (Use use the critical value approach.)

5) [4] Assuming the relationship between the variables mentioned in part (2) is best described by a straight line, use the method of least squares to estimate the y-intercept and slope of the line. (Also, provide the Least Squares Regression Line in the context of the question.)

6) [2] Provide an interpretation of the slope estimate and intercept of the Least Square Regression Line in the context of the question.

7) [4] Find a 90% confidence interval for the slope and provide an interpretation for the calculated interval.

8) [4] Find a 90% confidence interval for the mean weight change of all goslings with digestion efficiency of 17%. Interpret the result.

9) [4] Find a 90% prediction interval for the weight change of a gosling with digestion efficiency of 17%. Interpret the result.

10) [5] Plot the least squares line on your scatterplot and depict 90% confidence intervals for mean values and prediction intervals for new values over the entire range of the regression line.

11) [1] Find the coefficient of determination from the RSudio output and interprete the value.