Homework assignment 02

Use black text (if possible) for everything you include in this document. Keep both your answers and the original questions. Save this document in PDF format and submit it on Canvas. Please follow the general requirements described in the grading rubric.

1. Show a documentation header. Include your name, the purpose of the program, and the conditions under which others may or may not use your results.

2. Fit a multiple linear regression model with total sleep as the dependent variable, and predation, exposure, and danger as independent variable. Note that some reviewers might object to the use of these three independent variables. What would be their objection?

3. Ignore the reviewers objection and display an analysis of variance table. Interpret the F-ratio and p-value associated with this table.

4. Show the value of R-squared for this model and interpret it.

5. Calculate the residuals and predicted values for this model. Produce a Q-Q plot of the residuals and explain what it is telling you about the assumptions of your multiple linear regression model.

6. Draw a scatterplot of the residuals on the y-axis and the predicted values on the x-axis. Does this graph provide any evidence for nonlinearity or unequal variances?

7. Compute a correlation matrix for the three independent variables. Calculate the tolerance and variance inflation factor for this regression model. Is there any evidence of collinearity?