Stats 500 Homework 5

Online Submission to Canvas, Due date: 11:59pm, October 24, 2025

Q1. For Question 2 in Homework 4, check for influential points.

Q2 and Q3 are Exercises #3 and #4 on page 110 of Chap. 7 in <u>Linear Models with R (2nd edition).</u> The problem descriptions are as follows.

3. Using the `divusa` data:

   (a) Fit a regression model with `divorce` as the response and `unemployed`, `femlab`, `marriage`, `birth` and `military` as predictors. Compute the condition numbers and interpret their meanings.

   (b) For the same model, compute the VIFs. Is there evidence that collinearity causes some predictors not to be significant? Explain.

   (c) Does the removal of insignificant predictors from the model reduce the collinearity? Investigate.

4. For the `longley` data, fit a model with `Employed` as the response and the other variables as predictors.

   (a) Compute and comment on the condition numbers.

   (b) Compute and comment on the correlations between the predictors.

   (c) Compute the variance inflation factors.