Stats 500 Homework 6

Online Submission to Canvas, Due date: 11:59pm, Oct 31, 2025

1. Using the *cheddar* data, fit a linear model with *taste* as the response and the other three variables as predictors.

   (a) Suppose that the observations were taken in time order. Create a time variable. Plot the residuals of the model against time and comment on what can be seen.
   (b) Fit a GLS model with same form as above but now allow for an AR(1) correlation among the errors. Is there evidence of such a correlation?
   (c) Fit a OLS model but with time now as an additional predictor. Investigate the significance of time in the model.
   (d) The last two models have both allowed for an effect of time. Explain how they do this differently.

2. Using the *sat* data, fit a model with *total* as the response and *takers, ratio, salary* and *expend* as predictors using the following methods:

   (a) Ordinary least squares
   (b) Least absolute deviations
   (c) Huber's robust regression

   Compare the results. In each case, comment on the significance of predictors.