STAT 425 **Applied Regression and Design** **Spring 2020**

Homework No. 4

1 Instructions

Due Date: Monday Mar 30th, 11:59 pm on Compass
Homework presentation should be neat. You should submit your homework through Compass. R codes should be submitted jointly with your report. **Please submit your digital files in .pdf or .html format**, so it is easier for the graders to open your files. If you feel it would help, you are encouraged to discuss Homework results with other students, but you have to present assignments individually using your own words. The aim of the homework is to learn the material and practice for the exams. Graduate students should attempt **all** problems unless they are labeled as UG. Undergraduate students can skip problems labeled as GR.

2 Problems

1. **Problem 1**: For the *salmonella* data set fit a linear model with *colonies* as the response, and $\log(dose + 1)$ as predictor. Check for lack of fit.

2. **Problem 2**: The *gammaray* dataset shows the x-ray decay light curve of gamma ray burst. Build a model to predict the flux as a function of time that uses appropriate weights

3. **Problem 3 (UG)**: 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 correlation between predictors

   (c) Compute and comment on the variance inflation factors.

4. **Problem 3 (GR)**: For the *prostate* data, fit a model with *lpsa* as the response and the other variables as predictors.

   (a) Compute and Comment on the Condition numbers

   (b) Compute and comment on the correlation between predictors

   (c) Compute and comment on the variance inflation factors.

Note: All datasets are from the faraway library in R