MTH225 Fall2016 Final Problem 17

In this exercise we will estimate the slopes and intercept of a model with two non-parallel regression lines with a common intercept.

The model in this exercise can use the following STAN model file:

- **MTH225_Fall2016_Final_Problem17.stan** Two regression lines with common intercept

The data for this exercise is in **MTH225_Fall2016_Final_Problem17.csv**. The variable names are:

- **y** The dependent variable

- **x** The independent variable or predictor

- **grp** Group indicator (1 or 2)

- 2 points: Write R code to read the data and convert it to an R data frame.

- 1 point: Write the data block of a STAN model file that extracts the data from the R workspace.

- 1 point: Write the parameters block of a STAN model file that declares the paramter(s) of your model.

- 2 points: Write the model block of a STAN model file that specifies the priors and likelihood for your model.

- 1 point: Write R code to apply the **extract** function to the data structure output from the **stan** function.

- 1 point: Use the **extract()** function of the RSTAN package to obtain the values for the parameters from the posterior draw.

- 1 point: From the results of the **extract**, construct a vector of 4000 differences between the slopes for the two lines.

- 1 point: Use the vector of differences with the **quantile** function to construct a 95% confidence interval for the difference between the slopes.

(10 points possible)