MTH225 Spring2017 Final Problem 9

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_Spring2017_Final_Problem9.stan` Two regression lines with common intercept

The data for this exercise is in `MTH225_Spring2017_Final_Problem9.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)