# Homework 12

*Math 315, Fall 2019*

*Due 19 November by 4:00 p.m.*

*Instructions*: Complete the following problem and submit it by 4 p.m. on the due date. Please make sure that your solution is neatly written, clearly organized, and stapled (if there are multiple pages). You may complete derivations by hand, but any R work should be completed using R Markdown to render the final write up. You may hide the plotting code chunks, but you need to include your JAGS/R code where you fit your models.

*BSM* Chapter 4 exercises 4

*BSM* Chapter 5 exercises 1, 2, 5

Remarks:

- You can load the data for exercise 4.4 using the following command. This will bring the objects `N`, `X`, `Y`, and `Z` into your working environment.

  ```
  load(url("http://www4.stat.ncsu.edu/~reich/BSMdata/guns.RData"))
  ```

- You can load the data for exercise 5.5 using the following command. If you are working on a location installation of R, you will need to install the `geoR` package first.

  ```
  data("gambia", package = "geoR")
  ```

- For exercise 5.2, use the min, max, and SD of $\{Y_1, \ldots, Y_n\}$ and $\{X_{j1}Y_1, \ldots, X_{jn}Y_n\}$ (for $j = 1, \ldots, p$). The idea for investigating the latter set is that the products should resemble correlations. (This will result in 12 posterior predictive checks.)