STA402L: HOMEWORK 2

DUE: 11:59 PM ON XXX

Instructions. Solutions must be submitted to Gradescope as a single PDF. Programming exercises must be completed in R, should be clearly presented, and include all R code. Lab questions are restated here for convenience, but you should refer to the lab itself for details.

Total points. Book exercises: XXX; Lab exercises XXX; Overall: XXX.

BOOK EXERCISES

B1. (3 points) Show that the posterior variance of the beta–binomial model can be written as

$$\mathrm{Var}(\theta \mid y) = \frac{\mathbb{E}(\theta \mid y)\,\mathbb{E}(1-\theta \mid y)}{a+b+n+1}\,.$$

B2. Hoff 3.1.

(a) (1 point)

(b) (1 point)

(c) (1 point)

(d) (1 point)

(e) (2 points)

LAB EXERCISES

L1. (1 point) Plot a histogram of θ from the `rstan` object called `pool_output`. Describe the distribution.

L2. Visualize the posterior distributions of the θ_i with boxplots. In the plot, there should be one box and whiskers object for each θ_i.

L3. Take a few minutes to look at the contents of the two files `lab-02-pool.stan` and `lab-02-nopool.stan`. How are they different?