

Stat238: Lab 5

September 30

- This lab explores non-MCMC-based computations for simulating from the posterior in a hierarchical model, which is possible in the simple models discussed in Chapter 5.
- It's based on Exercise 5.15 in BDA and follows the approach discussed in the reading in Chapter 3.
- This problem is also part of PS2.
- I'm also happy to discuss any aspects of Lab 4, which focused on computational strategies for a simple non-hierarchical problem without conjugacy.
- As per my comment last week, don't stay stuck for too long on any aspect of the problem without chatting with me. The whole point of lab is to work on the problems in a context in which you can get assistance when needed.

Problem

- BDA exercise 5.15 (see *yusuf.csv* for the data from Table 5.4). Some comments:
 - As discussed in Chapter 5, you should be able to simulate in turn from $p(\tau|y)$, $p(\mu|\tau, y)$, and $p(\theta_j|\tau, \mu, y)$, thus drawing from $p(\tau, \mu, \{\theta_j\}|y)$. Before you start coding, you'll probably want to plan out the sequential steps of the simulations needed to answer the problems and set up the data structures in which you'll store the simulation output. One challenge of this problem is simply keeping track of and organizing your simulation draws.
 - Problem 5.15b is an example of using a conditional posterior for conceptual understanding, although one would generally not use it for inference since we'd want to average over the uncertainty in τ . You'll need to draw multiple μ values for a given τ in order to average over the uncertainty in μ .