STAT 457 - FINAL

Martha Eichlersmith

2019-12-12

Problem 1

Recall the genetic linkage model of Section 5.1.

Problem 1a

Problem 1a Part 1

For the data $Y = (125, 18, 30, 34)$, implement the Gibbs sampler alogrithm. Use a flat prior on θ.
Plot θ^i versus iteration i. How long a chain (or chains) did you use? Did you toss out any initial vlaues?

Problem 1a 2

Compute the posterior mean and posterior variance based on your chain.

Problem 1a 3

Plot the estimated observed posterior along with the normalized likelihood.

Problem 1a Part 4

Discuss the adequacy of the estimate.

Problem 1b

Repeat (1a) for $Y = (14, 0, 1, 5)$.

Problem 1c

Run 20 chains with independent starting values. Compute the average of the θ's in each chain.
Calculate the standard deviation of the 20 averages. Intepret this value.
Compute the standard deviation of the θ's in each chain.
Divide each SD by the square root of the number of iterations. Average these "standard errors" and compare this to the average

Problem 2

Problem 3

Problem 4

Problem 5