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**Homework 11****Due: Wed 04/14/21 @ 11:59pm**[rutgers.instructure.com/courses/120689](https://rutgers.instructure.com/courses/120689)

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**Problem 1.** Chapter 13, Exercise 6. As a reminder, this chapter of the book uses notation  $\phi$  for the parameter of interest,  $\gamma$  for the nuisance parameter (or missing data), and  $y$  the observed data.

**Problem 2.** Chapter 13, Exercise 9. For consistency, use “true” hyperparameter values  $(\mu, \tau, \sigma) = (0, 2, 1)$  for your simulation. Make sure to verify that your EM algorithm increases the log posterior at every iteration. Report the final posterior modes and the log posterior value at convergence.

**Problem 3.** Program the Rectangle Loop algorithm from Prof. Guanyang Wang’s paper for  $100 \times 100$  binary matrices. Report the Monte Carlo acceptance probabilities for when the algorithm is applied to matrices with fill portions 1%, 10%, and 50%. Verify your algorithm by checking whether your results agree with those indicated in Table 4.