STAT 451: Computational Statistics, Spring 2020　　Homework 4

Due date: March 6, 2020 (Friday), before class

1) Consider Example 7.4 (Stream Ecology) on pages 210∼212. It's about counts of insects in each of c different classes at a particular site. Set $c = 3$, $\alpha_1 = 3$, $\alpha_2 = \alpha_3 = 1$, and $\lambda = 50$.

   (a) Use Gibbs sampler described in Example 7.4 to simulate Markov Chain iterations based on the joint distribution of $\{N, Y_1, Y_2, Y_3, P_1, P_2, P_3\}$. Describe your algorithm in details first.

   (b) Plot the sample paths for N, Y_1, Y_2, P_1, P_2 respectively. Make comments on your plots.

   (c) List summary statistics of N, Y_1, Y_2, P_1, P_2 respectively. Report any finding based the summary statistics. You may wish to remove iterations as burn-in period.

2) Problem 7.6 on page 233.