MATH 472/572 Computational Statistics - Spring 2020
Homework 8 - Due March 31, Tuesday
Instructor: Leming Qu

Rules for HW:

- You are allowed to discuss HW with fellow students in the course, but the work you hand in must be your own.

- You have to write your own Python code by yourself. You are prohibited from sharing, copying or editing any Python code from other students.

How to turn in your coding portion of the HW?

- Submit your code in Jupyter Notebook format (.ipynb file) through the blackboard HW link. The deadline for code submission is the class starting time 1:30PM of the due date.

- Required output (prints and plots) must be included in the Jupyter Notebook - do not expect the Grader to run the code to see the required output. If the required output is not included in the Jupyter Notebook, the grader will take points off accordingly.

Coding Assignments:

1. (20 Points)Implementing Example 6.3 on page 165 of *Computational Statistics*, reproduce FIGURE 6.7.

2. (20 Points) Implementing SIR algorithm in Example 6.4 on page 166 for the case of Example 6.2. Report your estimated posterior mean and posterior standard deviation. Show the generated random samples by superimposing the following three items in a single plot:

   (a) a relative frequency histogram with appropriate number of bars for your generated random numbers with sample size n = 5000;

   (b) an estimated probability density curve based on the generated random numbers;

   (c) the true posterior probability density curve

   (Requirement for the plot: you must use different line type for different curves, and use legend to show which line type is for which curve in the plot itself.)