Homework 5: Chapter 4 of MSWR

Your Name Here

Due: Tuesday, Apr 27

set.seed(888) for all problems

1. Consider the population $\{3, 6, 7, 9, 11, 14\}$. For samples of size 3 without replacement, find (and plot) the sampling distribution of the minimum. What is the mean of the sampling distribution?

Note: For the question 2, you need to know about the Uniform distribution is. (We did not talked about this distribution in class) As far as R codes go, knowing how to generate a random sample from a uniform distribution in R is enough.

2. Let X be a uniform random variable on the interval $[40, 60]$ and Y a uniform random variable on $[45, 80]$. Assume that X and Y are independent.
   a. Simulate the sampling distribution of $X + Y$. Desribe the graph of the distribution of $X + Y$. Compute the mean and variance of the sampling distribution using the simulation.
   b. Suppose the time (in minutes) Jack takes to complete his statistics homework is Unif$[40, 60]$ and the time JIll takes is Unif$[45, 80]$. Assume they work independently. One day they announce that their total time to finish an assignment was less than 90 min. How likely is this?

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3. The amount of time spouses shop for anniversary cards can be modeled by an exponential distribution with the average amount of time equal to 8 minutes.
   a. Suppose 10 spouses are shoping for anniversary cards. Use the CLT to estimate the probability that, the ***mean*** *time* spent is less than 5 minutes.
   b. Use a sumulation to estimate the probability in part a)

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4. Complete the *Exercise 4.5 (Page 94 of MSWR)*
