812 Section # 10

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1 Convergence and the Weak Law of Large Numbers

Exercise 1 Graduate students order 2.5 cups of coffee on average every time they go to Steep and Brew, with standard deviation 2. There are 110 graduate students ahead of you in line at the Education Building, and Steep and Brew has enough materials to make 250 cups of coffee. What is the probability that they will run out of coffee before you get to order?

Exercise 2 You draw 1,000 samples from a large population with mean 500 and standard deviation 150. What is the probability that the sample mean will be between 490 and 510?

Exercise 3 Let Y_1, Y_2,...Y_{10} be random variables that are independent and identically distributed according to a binomial distribution with parameters n and p. Define $Z = \sum_{i=1}^{10} Y_i$ as the sample mean of that sequence.

a. What is $E[Z]$?

b. What is the variance of Z?

2 To R!

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