Week 4 - Discussion

Problem 1. In 2019, I lived in La Regencia apartment. Usually, I took the bus to school at the nearest stop every 9:00 AM. This bus runs every 15 minutes from 7:00 AM. Assume the available space for each bus is only enough for 5 people. On average, during 8:45 – 9:00 AM, there are 4 people waiting for this bus, i.e., they are in advance of me to get on the bus.

a. Apply a most appropriate distribution to find the probability that I can not get on the first bus.

b. Assume other people at this stop will not leave. Find the probability that I can not get on two consecutive buses. (You may use R to solve this question)

If I miss two buses, I would take Uber to school for saving time. Assume I face the same situation for every day.

c. How many days do I expect that I will take two times Uber to school?

d. Thinking in terms of the mean and standard deviation, if it is usual for me to take Uber to school once every three months?

Problem 2. In Geisel library, a front desk staff reports there are approximate 20 students per hour coming to borrow books on Mondays.

a. Get an average rate of the number of students coming to borrow books in a minute.

b. Find the probability that there are at least 2 students coming to borrow books in a minute.

c. If we let the exponential random variable Y be the number of minutes that the front desk staff need to wait to meet a student coming for books. Find the expected value of Y.

d. Find the probability that the front desk staff has to wait at least 3 minutes to meet a student.