Name: Feedback

SA402 · Dynamic and Stochastic Models Fall 2022 · Uhan

Quiz 3 – 9/21/2022

Instructions. You have 15 minutes to complete this quiz. You may use your plebe-issue calculator. You may use your own class materials (i.e., notes, homework, textbook).

Show all your work. To receive full credit, your solutions must be completely correct, sufficiently justified, and easy to follow.

Problem	Weight	Score
1	1	
2	1	
3	1	
4	1	
5	1	
Total		/ 50

For Problems 1-5, consider the following setting.

Patients arrive at the Simplexville Hospital emergency room at a rate of 5 per hour. A doctor works an 8-hour shift from 12 a.m. until 8 a.m. Suppose the arrivals follow a Poisson process.

Problem 1. What is the expected number of patients that the doctor will see between 12 a.m. and 3 a.m.?

Nearly all of you had the right idea here. See Example 2 in Lesson 4 for a similar example.

Problem 2. What is the probability that the doctor will see exactly 10 patients between 12 a.m. and 3 a.m.?

Note that this problem is asking about the probability that Y_3 is exactly 10. How can you use the pmf of Y_3 to solve this problem?

Problem 3. What is the probability that the doctor will see her 17th patient before or at 3 a.m.?

See Example 5 in Lesson 4 or Problem 1b in the Lesson 4 Exercises for similar examples.

Problem 4. If the doctor has seen exactly 5 patients by 2 a.m., what is the probability that the doctor will see a total of 20 or more patients by 4 a.m.?

See Example 3 in Lesson 4 or Problem 1ac in the Lesson 4 Exercises for similar examples.

Problem 5. What is the expected number of patients the doctor will see during her shift, if she sees exactly 30 patients by 4 a.m.?

See Example 4 in Lesson 4 for a similar example.