11. Exercise: The busy tellers

Exercises due May 13, 2020 05:29 IST *Completed*

Exercise: The busy tellers

1/1 point (graded)

When you enter the bank, you find that there are only two tellers, both busy serving other customers, and that there are no other customers in queue. Assume that the service times for you and for each of the customers being served are independent identically distributed exponential random variables, with parameter $\lambda = 1$. What is the expected time from your arrival until you and the other two customers are all finished being served?

2 ✔ **Answer:** 2

Solution:

The time until the first service completion is exponential with parameter 2 and mean 1/2. (This is similar to waiting for the first of two independent exponential lightbulbs to burn out.) After the service completion, both tellers are again busy with their respective customers. Using the fresh-start property, the time until the next service completion is also exponential with parameter 2 and mean 1/2. Subsequently, there will be only one person being served, and the expected time until the last service completion is 1. Thus, the overall expected time until all customers are served is

$$\frac{1}{2} + \frac{1}{2} + 1 = 2.$$

Submit You have used 2 of 3 attempts

Answers are displayed within the problem

Discussion

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Topic: Unit 9: Bernoulli and Poisson processes:Lec. 23: More on the Poisson process / 11. Exercise: The busy tellers

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Is this a good model?	Would this be a good model of the real situation? Especially, do we want to use exponential distribution ...	5
Wow, I hit submit twice.	It's 5:32 in the morning. And now I know that even when you already replied correctly, it will take the foll...	2
Hint	Combination of minimum(s) and maximum(s)	2
Help for intuitive sense	Remember there are two people being served. After one is over, the third one will be served and again t...	3 new
Useful Hint	What if there was only 1 teller busy serving only one customer when I entered the bank? Will the solutio...	2

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