6. Exercise: Processes in the park

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

Exercise: Processes in the park

2/2 points (graded)

As in an earlier exercise, busy people arrive at the park according to a Poisson process with rate $\lambda_1 = 3$/hour and stay in the park for exactly $1/6$ of an hour. Relaxed people arrive at the park according to a Poisson process with rate $\lambda_2 = 2$/hour and stay in the park for exactly half an hour. The arrivals of busy and relaxed people are independent processes. Assume that no other people arrive at the park.

Is the process of total arrivals at the park a Poisson process? If yes, enter the rate of that process in the answer box below. If it is not, enter 0.

5 ✔ **Answer:** 5

Whenever a relaxed person exits the park, he/she enters a nearby coffee shop. (Assume, for simplicity, that going from the park to the coffee shop takes zero time.)

Is the process of arrivals of relaxed persons at the coffee shop a Poisson process? If yes, enter the rate of that process in the answer box below. If it is not, enter 0.

2 ✔ **Answer:** 2

Solution:

As discussed in the preceding video, it is a Poisson process whose rate is the sum, $3 + 2 = 5$, of the rates of the original processes.

The process of relaxed people arrivals at the coffee shop is identical to the process of relaxed people arrivals at the park, but delayed by half an hour. You can check that a Poisson process that is delayed by a constant amount has exactly the same statistical properties (independence, time-homogeneity, small time interval probabilities) and is therefore a Poisson process with the same rate, which is 2 in this case.

Submit You have used 2 of 3 attempts

Answers are displayed within the problem

Discussion

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Feedback This kind of question is much better than the single-shot, 8-point questions encountered earlier. These t...	7
Delayed Poisson Process I understand the reason why a delayed process is still Poisson, but I cannot rationally explain why this ap...	1
Rate vs Parameter	5
Hint for Q2 Think of the half-hour stay in park of a relaxed person as a condition, then we can invoke the fresh start ...	1
Hint Please watch the previous video again if anyone is stuck in this simple question.	4
Intuitive for question 2 You can revise this video [A linear function of a continuous r.v.][1] .It could help. [1]: https://courses.edx....	1