Exercise: Processes in the park

(2/2 points)

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

Answer:
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.

You have used 1 of 2 submissions

Exercises 23 due May 11, 2016 at 23:59 UTC

Solved problems

Additional theoretical material

Problem Set 9
Problem Set 9 due May 11, 2016 at 23:59 UTC

Unit summary

▸ Unit 10: Markov chains


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