Exercise: More on fresh start

(1/1 point)

Consider a Bernoulli process with parameter $p = 1/3$. Let, as usual, T_1 stand for the time of the first success. We are told that the results of the two slots that follow the first success are failures, so that $X_{T_1+1} = X_{T_1+2} = 0$. What is the conditional expectation of the second interarrival time, T_2, given this information? (Recall that the expectation of a geometric random variable with parameter p is equal to $1/p$.)

5 ✔

Answer: 5

Answer:
After time T_1, we have two failures, and these are part of the interarrival time T_2. Given this information, the process starts fresh at time $T_1 + 3$ and the number of trials from time $T_1 + 3$ onwards until the next success is geometric with parameter $1/3$, and has an expected value of 3. Therefore, the conditional expectation of T_2, given the information we were given, is $2 + 3 = 5$.

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