9. Exercise: More on fresh start

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

Exercise: More on fresh start

1/1 point (graded)

Consider a Bernoulli process with parameter $p = 1/3$. Let T_1 be the time of the first success and let $T_1 + T_2$ be the time of the second 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

Solution:

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 $2 + 3 = 5$.

Submit	You have used 1 of 3 attempts

ⓘ   Answers are displayed within the problem

Discussion

Hide Discussion

Topic: Unit 9: Bernoulli and Poisson processes:Lec. 21: The Bernoulli process / 9. Exercise: More on fresh start

💬 **Even after reading the solution I have no idea why the answer is what it is.**
Can someone post a more detailed explanation of the solution after the homework due date? I'm totally …   **1**

❓ **Does the time count from 0 or 1?**
I looked at the answer and now supposing that my answer was wrong due to I didn't get at what time do…   **1**

💬 **Well I completely ignored the pt of this excercise....**
Thinking was right, reading was careless -->> interarrival TIME (for those who want to avoid my mistake)   **3**

💬 **Hint - Another approach from the solution printed**   2 new   **6**

☑ **Unit of time?**
What is the unit of time that we should consider in this problem? It is **not mentioned** in the problem…   **2**

☑ **Final exam date?**
Does anyone know when the final exam will be out? I thought it was supposed to be available on the 30t…   **3**

💬 **Hint**   **4**

❓ **Is the answer supposed to be a number or an expression?**
Is the answer supposed to be a number or an expression?   **3**

💬 **another hint**
what is the expected value of an event that is certain in a time slot of a Bernoulli process?   **1**

💬 **Another Hint**
Following the two failures, T2 follows a geometric r.v. with the known mean. After you obtain that numb…   **1**

❓ **About fresh start**
I thought the future event is independent of the past, regardless of the results after 1st success. The refr…   **2**