



<u>Course</u> > <u>Unit 9:</u> ... > <u>Lec. 21:</u>... > 6. Exer...

## 6. Exercise: Time until the first failure

Exercises due May 13, 2020 05:29 IST Completed

Exercise: Time until the first failure

1/1 point (graded)

Let the sequence  $X_n$ ,  $n=1,2,3,\ldots$ , be a Bernoulli process with parameter  $\mathbf{P}\left(X_n=1\right)=p$  for all  $n\geq 1$ . Let U be the time when a value of 0 is first observed:  $U=\min\{n:X_n=0\}$  Then, the random variable U is:

- $\bigcirc$  Geometric with parameter p
- igcolumn Geometric with parameter 1-p
- None of the above



## **Solution:**

For  $n\geq 1$ , the event  $\{U=n\}$  corresponds to n-1 1's followed by a 0. Its probability is  $p^{n-1}$  (1-p), which corresponds to a geometric PMF with parameter 1-p.

Submit

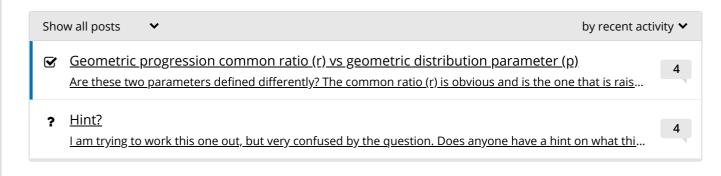
You have used 1 of 1 attempt

**1** Answers are displayed within the problem

Discussion

Hide Dis

**Topic:** Unit 9: Bernoulli and Poisson processes:Lec. 21: The Bernoulli process / 6. Exercise: Time until the first failure



© All Rights Reserved

