Exercise: Time until the first failure

(1/1 point)

Let the sequence X_n, $n = 1, 2, 3, \ldots$, be a Bernoulli process with parameter $\mathbf{P}(X_n = 1) = p$ 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:

- Geometric with parameter p
- Geometric with parameter $1 - p$ ✔
- None of the above

Answer:

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 $1 - p$.

- Unit 6: Further topics on random variables
- Unit 7: Bayesian inference
- Exam 2
- Unit 8: Limit theorems and classical statistics
- **Unit 9: Bernoulli and Poisson processes**

Unit overview

Lec. 21: The Bernoulli process
Exercises 21 due May 11, 2016 at 23:59 UTC

Lec. 22: The Poisson process
Exercises 22 due May 11, 2016 at 23:59 UTC

Lec. 23: More on the Poisson process

You have used 1 of 1 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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