

16. Exercise: Splitting

Exercise: Splitting

1/1 point (graded)

For each exam, Ariadne studies with probability $\frac{1}{2}$ and does not study with probability $\frac{1}{2}$, independently of any other exams. On any exam for which she has not studied, she still has a **0.20** probability of passing, independently of whatever happens on other exams. What is the expected number of total exams taken until she has had 3 exams for which she did not study but which she still passed?

✓ Answer: 30

Solution:

The sequence of exams for which she does not study and passes can be modeled as follows. We look at the exams for which she has not studied (a Bernoulli process with parameter $\frac{1}{2}$) and "split" it according to whether she passes or not. This creates a new Bernoulli process for the exams for which she does not study and passes, with parameter $(\frac{1}{2}) \cdot 0.20 = 0.10$. The expected time until 3 successes in this process is $3/0.10 = 30$.

你已经尝试了1次 (总共可以尝试3次)

📘 Answers are displayed within the problem

讨论

主题: Unit 9 / Lec. 21 / 16. Exercise: Splitting