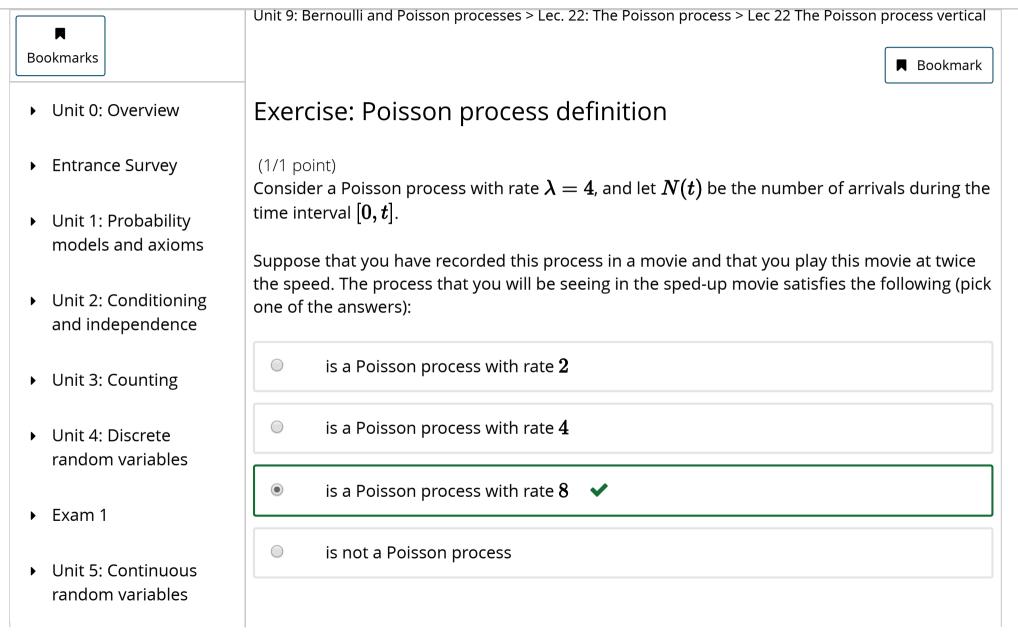


## MITx: 6.041x Introduction to Probability - The Science of Uncertainty



- 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

Answer:

Let M(t) be the number of arrivals in the sped-up movie between times  ${\bf 0}$  and  ${\bf t}$ . By time  ${\bf t}$ , you have watched in the sped-up movie whatever happens in the original process from time  ${\bf 0}$  through time  ${\bf 2}t$ . Thus, M(t)=N(2t). The independence and time-homogeneity properties of the original process can be seen to imply the same properties for the sped-up process. Furthermore,

$$\mathbf{P}ig(M(\delta)=1ig)=\mathbf{P}ig(N(2\delta)=1ig)pprox\lambda\cdot(2\delta)=(2\lambda)\delta,$$

which leads to the rather intuitive conclusion that the sped up process has a rate of  $2\lambda=8$ .

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, (A) 2016 at 23:59 UTC

**Unit summary** 

Unit 10: Markov chains

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