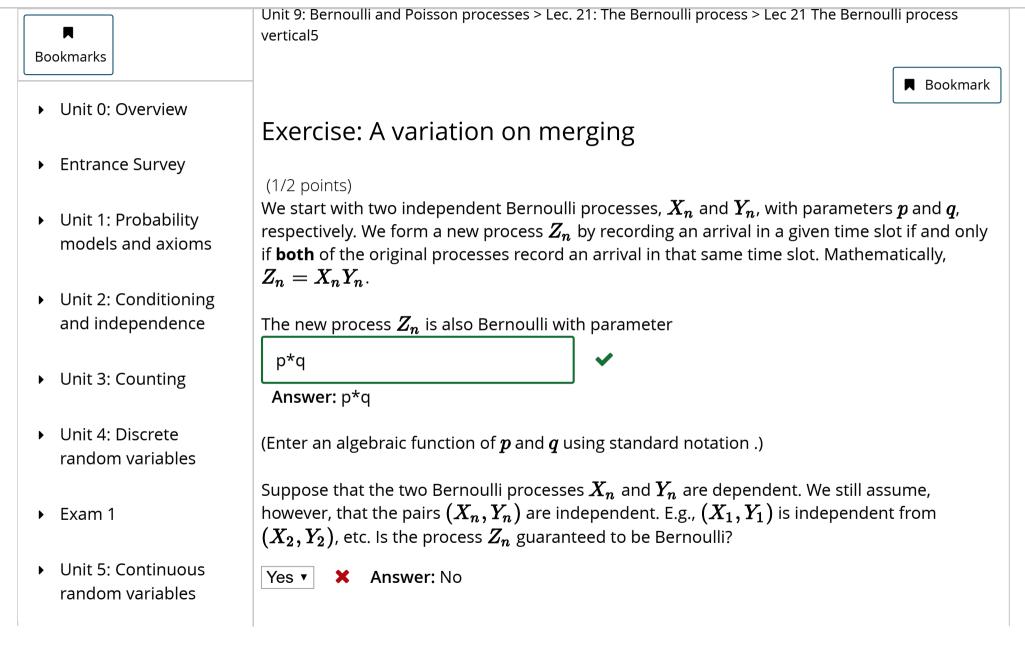


MITx: 6.041x Introduction to Probability - The Science of Uncertainty



- 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:

The merged process records an arrival if and only if both of the original processes record an arrival, which happens with probability pq.

In the second case, since the pairs (X_n,Y_n) are independent, the random variables Z_n are also independent. However, there is nothing in the statement that would ensure that the Z_n are identically distributed. Thus, Z_n is not guaranteed to be a Bernoulli process. For example, consider the special case of p=q and suppose that $Y_1=X_1$ but Y_n is independent of X_n for n>1. Then $\mathbf{P}(Z_1=1)=p$ while $\mathbf{P}(Z_n=1)=p^2$ for n>1, violating the time-homogeneity property of Bernoulli processes.

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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