



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



Bookmarks

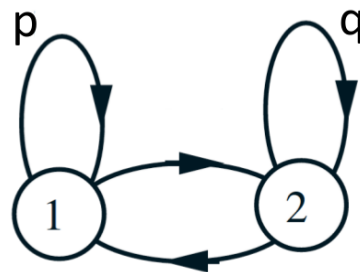
- ▶ Unit 0: Overview
- ▶ Entrance Survey
- ▶ Unit 1: Probability models and axioms
- ▶ Unit 2: Conditioning and independence
- ▶ Unit 3: Counting
- ▶ Unit 4: Discrete random variables
- ▶ Exam 1
- ▶ Unit 5: Continuous random variables

Unit 10: Markov chains > Lec. 24: Finite-state Markov chains > Lec 24 Finite-state Markov chains vertical4

Bookmark

Exercise: Convergence

(5/5 points)

Consider the following transition probability graph, where $0 \leq p \leq 1$ and $0 \leq q \leq 1$:


1. Give the values of p and q for which you know for sure that $r_{12}(n)$ will never converge to a constant when n goes to infinity.

 $p =$ Answer: 0

- ▶ 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 10: Markov chains

Unit overview

Lec. 24: Finite-state Markov chains

Exercises 24 due May 18, 2016 at 23:59 UTC 

Lec. 25: Steady-state behavior of Markov chains



$q =$ Answer: 0

2. For each of the following pairs of (p, q) , would it be guaranteed that $r_{11}(n)$ converges to zero as n goes to infinity?

- $p = 0.99, q = 1$



Answer: Yes

- $p = 0, q = 0$



Answer: No

- $p = 1, q = 1$




Answer: No

Answer:


1. If $p = q = 0$, then $r_{12}(n) = 1$ for all odd n and $r_{12}(n) = 0$ for all even n .

2.

•


Exercises 25 due May 18, 2016
at 23:59 UTC 

**Lec. 26: Absorption
probabilities and
expected time to
absorption**

Exercises 26 due May 18, 2016
at 23:59 UTC 

Solved problems

Problem Set 10

Problem Set 10 due May 18,
2016 at 23:59 UTC 

Yes. Eventually the chain will jump to 2 and stay there forever. Hence, the probability of ending up in state 1 after n transitions will converge to 0 as n goes to infinity.

- No. As stated in part (1), there is no convergence in this scenario since $r_{11}(n)$ will alternate between 0 and 1.
- No. Given that we start in state 1, we will stay in state 1 forever. Hence, $r_{11}(n) = 1$ for all n .

You have used 1 of 1 submissions

© All Rights Reserved



© edX Inc. All rights reserved except where noted. EdX, Open edX and the edX and Open EdX logos are registered trademarks or trademarks of edX Inc.

POWERED BY
OPENedX



