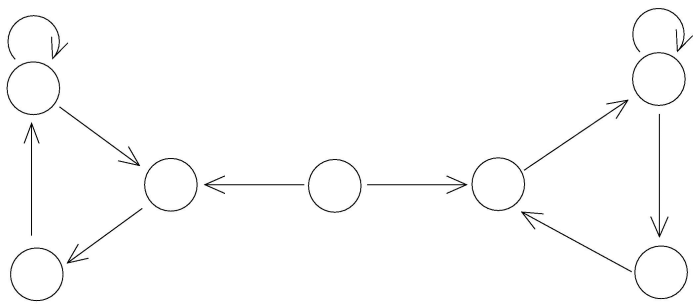
1. Steady-state convergence

Problem 1. Steady-state convergence

6/6 points (ungraded)

Let $X_0, X_1, \ldots$ be a Markov chain, and let $r_{ij}(n) \equiv \mathbf{P}\left(X_n = j \mid X_0 = i\right).$

1. Consider the Markov chain represented below. The circles represent distinct states, while the arrows correspond to positive (one-step) transition probabilities.



For this Markov chain, determine whether each of the following statements is true or false.

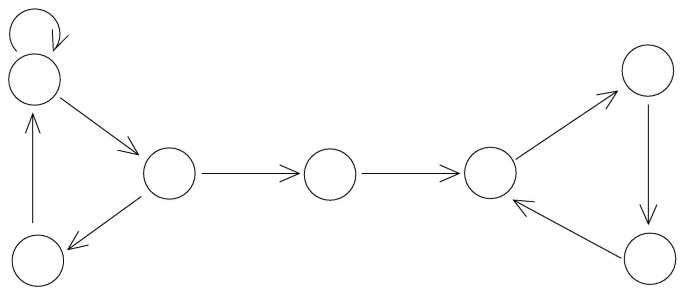
(a) For every i and j, the sequence $r_{ij}(n)$ converges, as $n \to \infty$, to a limiting value π_j, which does not depend on i.

False ▼ ✔

(b) Statement (a) is true, and $\pi_j > 0$ for every state j.

False ▼ ✔

2. Consider the Markov chain represented below. The circles represent distinct states, while the arrows correspond to positive (one-step) transition probabilities.



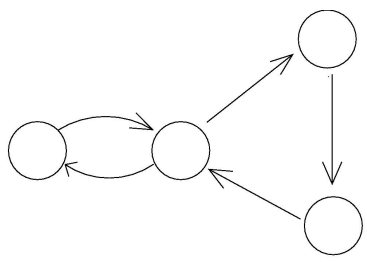
(a) For every i and j, the sequence $r_{ij}(n)$ converges, as $n \to \infty$, to a limiting value π_j, which does not depend on i.

False ▼ ✔

(b) Statement (a) is true, and $\pi_j > 0$ for every state j.

False ▼ ✔

3. Consider the Markov chain represented below. The circles represent distinct states, while the arrows correspond to positive (one-step) transition probabilities.



(a) For every i and j, the sequence $r_{ij}(n)$ converges, as $n \to \infty$, to a limiting value π_j, which does not depend on i.

True ▼ ✔

(b) Statement (a) is true, and $\pi_j > 0$ for every state j.

True ▼ ✔

提交 你已经尝试了3次（总共可以尝试3次）

讨论

显示讨论

主题： Unit 10 / Problem Set / 1. Steady-state convergence