X

Unit 8 - Week 7: Continuous Time Markov Chain

Course outline

How to access the portal

Week 1: Introduction to probability and Random Variable

Week 2: Random process basics and infinite sequence of events

Week 3: Convergence of Sequence of Random Variables

Week 4: Applications of Convergence Theory

Week 5: Markov Chain

Week 6:Discrete Time Markov Chain

Week 7: Continuous Time Markov Chain

Assignment 7

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-09-26, 23:59 IST.

1) Consider a DTMC with the state space $V = \{0, 1, 2, 3\}$ and characterized by the transition probability matrix *1 point*

$$P = \begin{bmatrix} \frac{1}{3} & \frac{2}{3} & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{5} & \frac{4}{5} \end{bmatrix}$$

Let $f_{j,j}$ is the probability that the chain eventually returns to state j, given that it is at state j at $n = 0$. Then the value of $f_{1,1}$ is

- $\frac{1}{3}$
- $\frac{1}{2}$
- $\frac{2}{3}$
- 1

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

2) Consider a DTMC with the state space $V = \{0, 1, 2, 3\}$ and characterized by the transition probability matrix *1 point*

$$P = \begin{bmatrix} \frac{1}{3} & \frac{2}{3} & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{5} & \frac{4}{5} \end{bmatrix}$$

. Then the state 3 is

Time Markov Chain-3
Quiz : Assignment 7
Week 8: Martingle Process
New Unit
Assignment Solutions

No, the answer is incorrect.
Score: 0

Accepted Answers:
Transient

3) Consider a DTMC with the state space $V = \{0, 1, 2, 3\}$ and characterized by the transition probability matrix *1 point*

$$P = \begin{bmatrix} 0 & 0.4 & 0.6 & 0 \\ 0.3 & 0.5 & 0 & 0.2 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}$$

The communicating class(es) of the chain is (are)

- $\{0, 2\} and \{1, 3\}$
- $\{0, 1\} and \{2, 3\}$
- $\{1, 2, 3\}$
- $\{0, 1, 2, 3\}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\{0, 1\} and \{2, 3\}$

4) Suppose $\{X_n, n \geq 0\}$ is a DTMC with state space $V = \{0, 1, 2\}$ and the state transition matrix *1 point*

$$P = \begin{bmatrix} \frac{3}{4} & \frac{1}{4} & 0 \\ \frac{1}{4} & \frac{1}{2} & \frac{1}{4} \\ 0 & \frac{3}{4} & \frac{1}{4} \end{bmatrix}$$

. The probability $P(X_1 = 1, X_2 = 2 | X_0 = 0)$ is equal to

- $\frac{1}{16}$
- $\frac{1}{8}$
- $\frac{1}{4}$
- $\frac{1}{2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{1}{16}$

5) Suppose $\{X_n, n \geq 0\}$ is a DTMC with state space $V = \{0, 1, 2\}$ and the state transition matrix *1 point*

$$P = \begin{bmatrix} \frac{1}{2} & \frac{1}{4} & \frac{1}{4} \\ \frac{1}{4} & \frac{1}{2} & \frac{1}{4} \\ 0 & \frac{3}{4} & \frac{1}{4} \end{bmatrix}$$

If $p_0^{(0)} = P(X_0 = 0) = 1$, then the probability $p_1^{(2)} = P(X_2 = 1)$ is equal to

- $\frac{1}{16}$
- $\frac{1}{8}$
- $\frac{5}{16}$
- $\frac{7}{16}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{7}{16}$

Previous Page End