Stochastic processes : Quiz

April 7, 2025

Question. What makes a stochastic process Markovian? You can choose to explain either in plain english or using a mathematical formula.

Problem. The professor warns CC-CI1 students not to use computers in the classroom. Each time a student attempts pushing the boundaries by using a computer 'again', the professor has probability $p > 0$ of giving them another warning, and probability $1 - p$ of excluding them from class. Once the professor excludes the first student from class for using a computer, the professor no longer gives warnings.

1. How do you model this problem as a Markov chain?

2. Let i be a transient state of the Markov chain above. What is the probability of never returning to i starting from i?

3. Starting from i, let X be the number of times that the chain returns to i before leaving forever. Find the distribution of X.

Full name*:

*This is a make-up quiz due to medical absence.