Homework 6

3 ноября 2024 г.

Problem 1. Consider the Markov chain on $S = \{0, 1, 2, 3, 4\}$ which moves a step to the right with probability $\frac{1}{2}$ and to the left with probability $\frac{1}{2}$ when it starts at $1, 2, 3$. If it is at 0, then assume it moves to 1 with probability 1 and if it as at 4 it moves to 3 with probability 1. Is this chain ergodic?

Problem 2. Consider the knight's tour on a chess board: A knight selects one of the next positions at random independently of the past.

- Why is this process a Markov chain?

- What is the state space?

- Is it irreducible? Is it aperiodic?

- Find the stationary distribution. Give an interpretation of it: what does it mean, physically?

- Which are the most likely states in steady state? Which are the least likely ones?