Homework 3

21 сентября 2024 г.

Problem 1. A Markov chain has the following transition probabilities:

$$p_{11} = p_{12} = p_{13} = \frac{1}{3}, p_{21} = p_{31} = 0, p_{22} = p_{23} = \frac{1}{2}, p_{33} = 1.$$

Find an absorbing state and, starting from the state 1, find an expected time until absorption occurs.

Problem 2. Smith is in jail and has 3 dollars; he can get out on bail if he has 8 dollars. A guard agrees to make a series of bets with him. If Smith bets A dollars, he wins A dollars with probability 0.4 and loses A dollars with probability 0.6. Find the probability that he wins 8 dollars before losing all of his money if:

- he bets 1 dollar each time (timid strategy);

- he bets, each time, as much as possible but not more than necessary to bring his fortune up to 8 dollars (bold strategy).

- Which strategy gives Smith the better chance of getting out of jail?