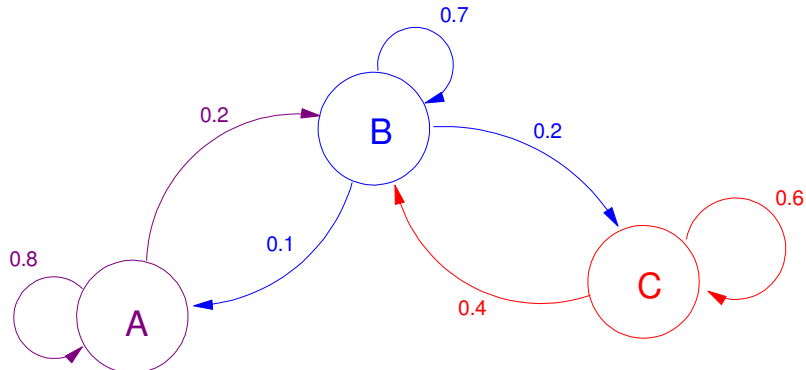


ECE 341 - Homework #11

Markov Chains.

Markov Chains

Three people are playing a game of hot potato. Each turn a player can keep the potato or pass it to another player. The probability of each decision are as follows:



- 1) Assume player A starts with the potato. Determine the probability that each player has the potato after 10 tosses using matrix multiplication.
- 2) Assume player A starts with the potato. Determine the probability that player A has the potato after k tosses using z-transforms.
 - What is the probability that player A has the potato after infinite tosses?
- 3) Assume player A starts with the potato. Determine the probability that player A has the potato after k tosses using eigenvalues and eigenvectors.

Markov Chains with Absorbing States

Problem 4 & 5: Two teams, A and B, are playing a match made up of N games. For each game

- Team A has a 50% chance of winning
- There is a 20% chance of a tie, and
- Team B has a 30% chance of winning

In order to win the match, a team must be up by 2 games.

- 4) Determine the probability that team A wins the match after k games for $k = \{0 \dots 10\}$ using matrix multiplication.
- 5) Determine the z-transform for the probability that A wins the match after k games
 - From the z transforms, determine the explicit function for $p(A)$ wins after game k .