

CCIS 4100: in-class exercise on Markov chains

Complete the following either on your own or in small groups. Note: this example derived from a problem presented by Michael Baron (<http://www.utdallas.edu/~mbaron/>).

Markov chains etc.

A system has three possible states: 0, 1 and 2. Every hour it makes a transition to a different state, which is determined by a coin flip. For example, from state 0, it makes a transition to state 1 or state 2 with probabilities 0.5 and 0.5.

1. Draw a diagram summarizing this stochastic process (i.e., the CPT).
2. Write down the transition probability matrix.
3. Assume we start at state 0. Write down the distribution over states after three transitions.
4. Find the steady-state distribution of the Markov chain.