

Tutorial 12 Answers
Markov Chains: Steady State Behavior and Absorption Probabilities
May 11 & 12, 2006

1. See online solutions.
2. (a) J , is a geometric random variable with success probability equal to 0.5. The variance for J is given by:

$$\sigma_J^2 = \frac{1-p}{p^2} = 2$$

- (b) If you assumed that π_i denoted steady state probabilities, then these probabilities do not exist.
- (c) The probability of getting absorbed to the first recurrent class is 1, and to the second recurrent class is 0. Hence, the steady state probabilities now exist and they are given by,

$$\pi_1 = \frac{4}{5} \cdot 1 = \frac{4}{5}$$

$$\pi_2 = \frac{1}{5} \cdot 1 = \frac{1}{5}$$

$$\pi_3 = \pi_4 = 0$$