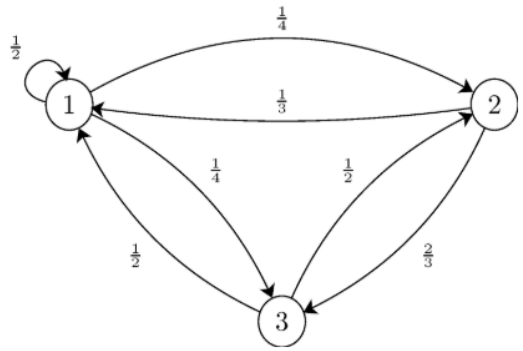
Consider the following Markov Chain:



Find the stationary distribution for this chain. State your answer as an integer between 100 and 999 such that you supply three decimal precision, correctly rounded off.

$\pi_1 = 0.$ 457 ✔

$\pi_2 = 0.$ 257 ✔

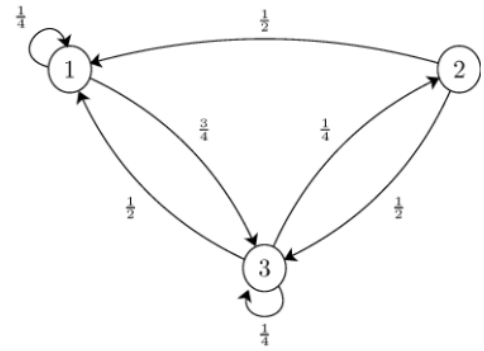
$\pi_3 = 0.$ 286 ✔

If we know $P(X_1 = 1) = P(X_1 = 2) = \frac{1}{4}$, find $P(X_1 = 3, X_2 = 2, X_3 = 1)$. State your inputs as two integers such that your answer is an irreducible fraction.

$\frac{1}{12}$ ✔

Markov – 1

Consider the Markov chain with three states:



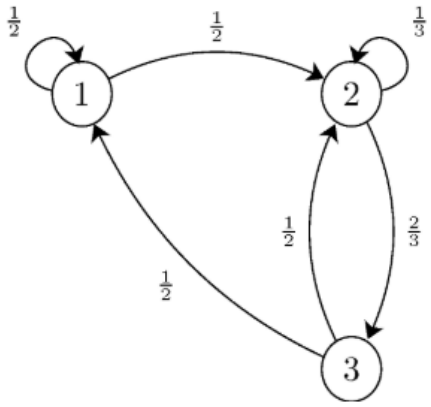
Suppose $P(X_1 = 1) = \frac{1}{2}$ and $P(X_1 = 2) = \frac{1}{4}$. Answer the questions below. State all inputs as integers between 0 and 99 such that your answers are irreducible fractions.

b. Find $P(X_1 = 3, X_2 = 2, X_3 = 1)$

c. Find $P(X_1 = 3, X_3 = 1)$

Markov – 2

Consider the Markov chain

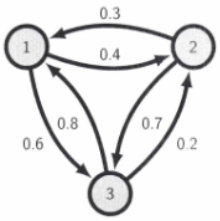


Find the stationary distribution for this chain. State all inputs as integers between 0 and 99 such that the answers are irreducible fractions.

$$\left[\pi_1, \pi_2, \pi_3\right] = \left[\frac{\boxed{2}}{7}, \frac{\boxed{3}}{7}, \frac{\boxed{2}}{7}\right]$$

Markov - 3

Consider the following Markov Chain $\{X_n : n = 0, 1, 2, \ldots\}$ with states $S = \{1, 2, 3\}$ and the following transition diagram:

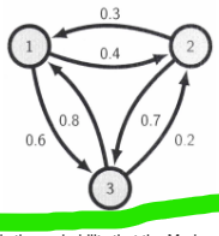


Assume the Markov Chain starts in state 1 with probability 1/2 and in state 2 with probability 1/2. What is the probability that the Markov Chain is in state 3 at time 3? State your input as an integer between 0 and 99 such that the answer has two decimal precision, correctly rounded off.

0.48 ✔

Markov – 4

Consider the following Markov Chain $\{X_n : n = 0, 1, 2, \ldots\}$ with states $S = \{1, 2, 3\}$ and the following transition diagram:

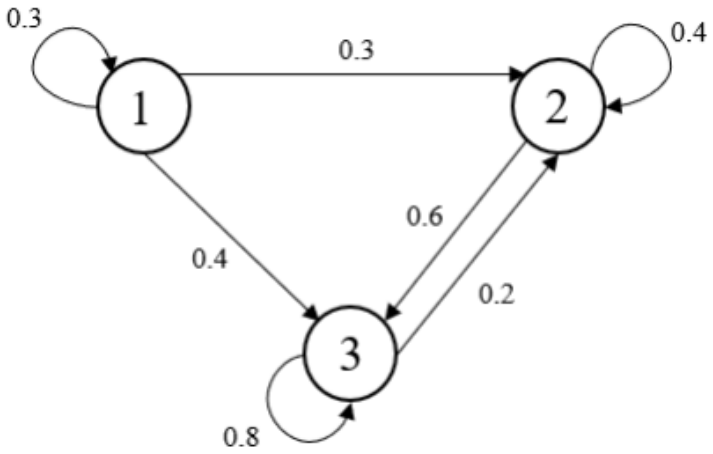


What is the probability that the Markov Chain, in the long run, will be in state 2. State your input as an integer between 0 and 99 such that you supply two decimal precision, correctly rounded off.

0.

Markov – 5

a. Let $\{X_n : n = 0, 1, \ldots\}$ denote a Markov Chain with states {1, 2, 3} and with the following state transition diagram:



Find the following probability. State your answers as integers between 0 and 99 such that you supply two decimal precision.

$$P\left(X_5 = 3 \mid X_3 = 1, X_2 = 2\right) = 0.\boxed{62}$$

b. Now let $\{X_n : n = 0, 1, \ldots\}$ denote another Markov Chain with states {1, 2, 3} and with the following state transition matrix:

$$P = \begin{bmatrix} 0.3 & 0.3 & 0.4 \\ 0 & 0.4 & 0.6 \\ 0.8 & 0.2 & 0 \end{bmatrix}$$

Determine the stationary distribution of this Markov chain. State your answers as integers between **100 and 999** such that you supply **three** decimal precision. **Note, you must supply three decimal precision.**

$$[0.\boxed{375}, 0.\boxed{297}, 0.\boxed{328}]$$

Markov – 6