



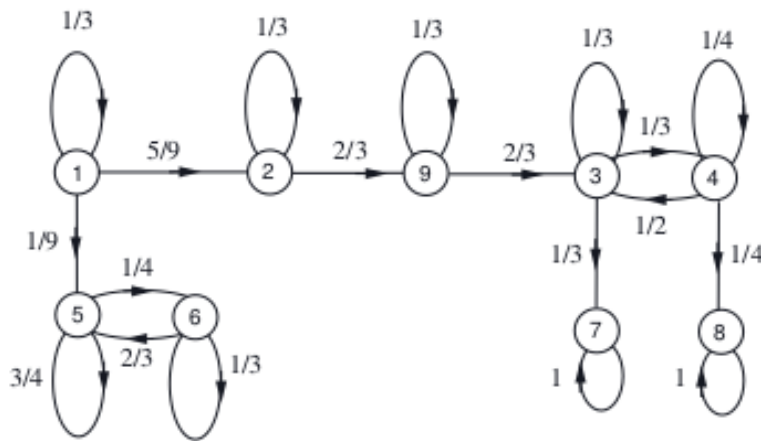
11. Exercise: Expected time to absorption

None due May 29, 2020 05:29 IST

Exercise: Expected time to absorption

0.0/2.0 points (ungraded)

Consider again the Markov chain with the following transition probability graph:



Assuming that $X_0 = 9$, what is the expected time until the Markov chain eventually reaches states 7 or 8?

Answer: 4.75

Solution:

States 7 and 8 can be combined into a mega-state, say state 10. Let μ_j be the expected time to eventually reach state 10 given that the chain starts in state j . We want to calculate μ_9 . We can write a system of three equations with three unknowns (μ_9 , μ_3 and μ_4) as follows:

$$\mu_9 = 1 + \frac{1}{3}\mu_9 + \frac{2}{3}\mu_3$$



$$\mu_3 = 1 + \frac{1}{3}\mu_3 + \frac{1}{3}\mu_4$$

$$\mu_4 = 1 + \frac{1}{2}\mu_3 + \frac{1}{4}\mu_4,$$

which gives the solution $\mu_3 = 13/4$, $\mu_4 = 14/4$, and $\mu_9 = 19/4$.

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You have used 0 of 3 attempts

i Answers are displayed within the problem


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 [matrix solution](#)

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 [hint](#)

[You can also ignore the network from state 9 to the left and calculate the expected number of steps fro...](#)

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