

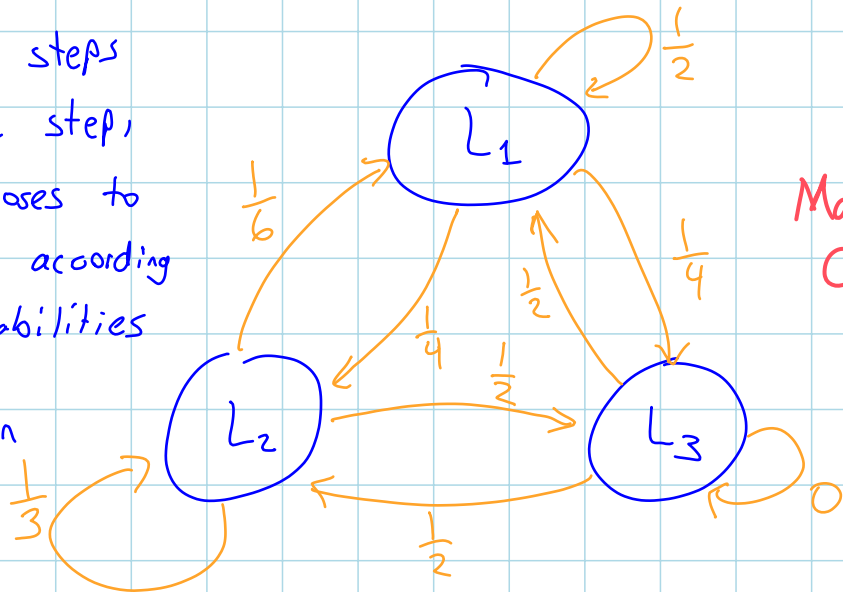
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## SCENARIO:

1 frog hopping between 3 lily pads

discrete time steps  
at each time step,  
the frog chooses to  
stay or hop according  
to the probabilities

What happens in  
the long term?



Markov  
Chain

## TRANSITION MATRIX

$$P = \begin{bmatrix} \frac{1}{2} & \frac{1}{6} & \frac{1}{4} \\ \frac{1}{4} & \frac{1}{3} & \frac{1}{2} \\ \frac{1}{4} & \frac{1}{2} & 0 \end{bmatrix}$$

probabilities of  
moving from L1

Entry in row  $i$ ,  
column  $j$  is the  
probability of moving  
from  $L_j$  to  $L_i$ .

We find a steady-state distribution:

$$\vec{v} \approx (0.384, 0.346, 0.269)$$

Property:

$$P \vec{v} = \mathbf{1} \vec{v}$$

so  $\vec{v}$  is an eigenvector  
of  $P$  corresponding  
to eigenvalue  $\lambda = 1$