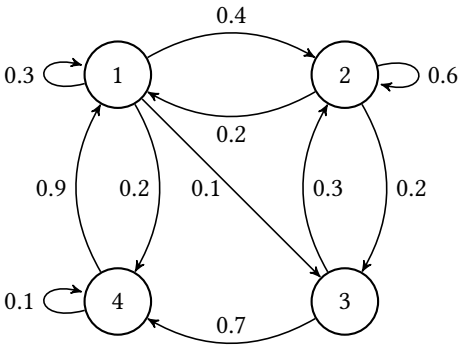


### a) Discrete-time Markov Chain



$$P = \begin{pmatrix} 0.3 & 0.4 & 0.1 & 0.2 \\ 0.2 & 0.6 & 0.2 & 0 \\ 0 & 0.3 & 0 & 0.7 \\ 0.9 & 0 & 0 & 0.1 \end{pmatrix}$$