Quantitative Methods & Simulation

Activity 08

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1. For each of the following matrices determine:
   a) If it represents a regular or non-regular Markov chain.
   b) If it's an absorbing Markov chain.
   c) The long trend or steady state of the matrix (if that's the case)

(a)

$$\mathbf{P} = \begin{pmatrix} .5 & .5 \\ .5 & .5 \end{pmatrix}$$

a) Regular
b) Not an absorbing Markov chain
c) .

(b)

$$\text{(b) } \mathbf{P} = \begin{pmatrix} .5 & .5 \\ 1 & 0 \end{pmatrix}$$

a) Irregular
b) Absorbing Markov chain
c) .

(c)

$$\mathbf{P} = \begin{pmatrix} 1/3 & 0 & 2/3 \\ 0 & 1 & 0 \\ 0 & 1/5 & 4/5 \end{pmatrix}$$

a) Irregular
b) Absorbing Markov chain
c) .

(d)

$$\mathbf{P} = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$

a) Irregular
b) Non absorbing Markov chain
c) .

(e)

$$\mathbf{P} = \begin{pmatrix} 1/2 & 1/2 & 0 \\ 0 & 1/2 & 1/2 \\ 1/3 & 1/3 & 1/3 \end{pmatrix}$$

a) Regular
b) Non absorbing Markov chain
c) .

(f)

$$\mathbf{P} = \begin{pmatrix} 1 & 0 & 0 \\ 1/4 & 1/2 & 1/4 \\ 0 & 0 & 1 \end{pmatrix}$$

a) Irregular
b) Absorbing Markov chain
c) .