Markov chains

Stochastic matrix \( \mathbf{P} = \begin{pmatrix} 0.6 & 0.3 \\ 0.4 & 0.7 \end{pmatrix} \)

1. \( \mathbf{x}_0 \) is the population distribution in 2017

2. \( \mathbf{x}_n = \mathbf{P} \mathbf{x}_{n-1} \) is the population distribution in 2018

**Question** Does there exist a steady-state vector (equilibrium) \( \mathbf{\bar{x}} \) such that:

\[
\mathbf{P} \mathbf{\bar{x}} = \mathbf{\bar{x}}
\]

and if so: Is it unique?