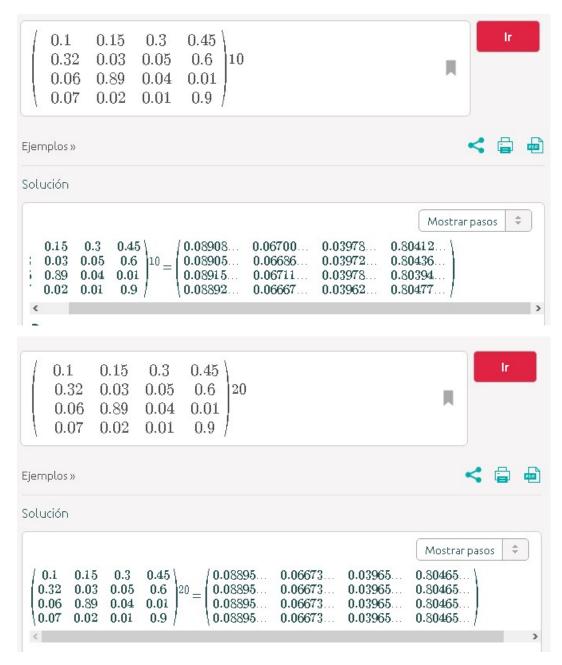
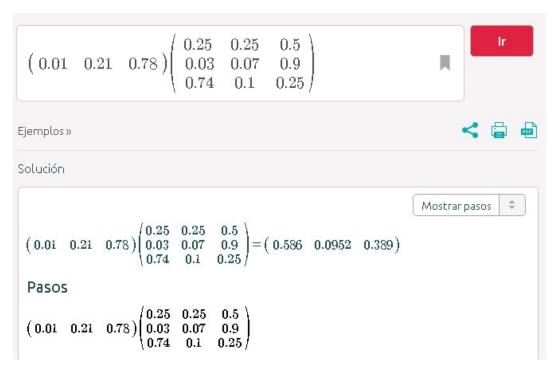
1.

A stochastic matrix is the representation of a Markov chain and therefor its entries are positive and add to 1.

2.



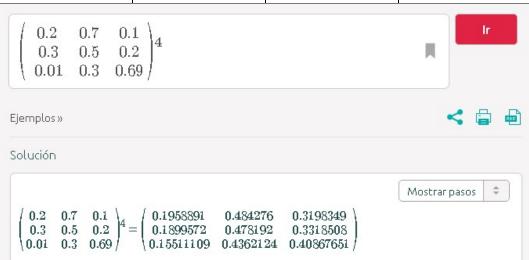
3.



4.

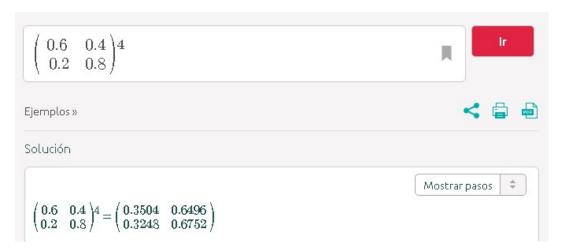
$$\begin{vmatrix} 0.07 & 0.01 & 0.67 & 0.25 \end{vmatrix}^4 \begin{vmatrix} 0.41308 & 0.20600 & 0.28949 & 0.09143 \\ 0.3 & 0.33 & 0.3 & 0.07 \\ 0.74 & 0.2 & 0.02 & 0.04 \\ 0.11 & 0.42 & 0.46 & 0.01 \end{vmatrix} = \begin{vmatrix} 0.41308 & 0.20600 & 0.28949 & 0.09143 \\ 0.35311 & 0.18349 & 0.34842 & 0.11498 \\ 0.27294 & 0.15215 & 0.42812 & 0.14679 \\ 0.39872 & 0.20086 & 0.30328 & 0.09714 \end{vmatrix}$$

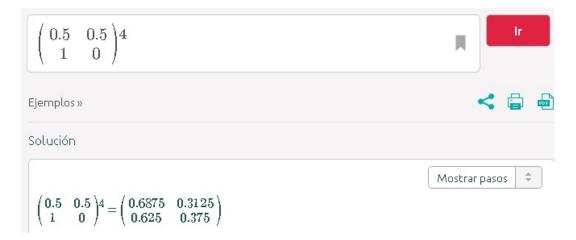
	Н	Α	S
Н	0.2	0.7	0.1
Α	0.3	0.5	0.2
S	0.01	0.3	0.69



6.

а





C

Solución

$$\begin{pmatrix} 1 & 0 & 0 \\ 0.25 & 0.5 & 0.25 \\ 0 & 1 & 0 \end{pmatrix}^2 = \begin{pmatrix} 1 & 0 & 0 \\ 0.375 & 0.5 & 0.125 \\ 0.25 & 0.5 & 0.25 \end{pmatrix}$$

Solución

$$\begin{pmatrix} 1 & 0 & 0 \\ 0.25 & 0.5 & 0.25 \\ 0 & 1 & 0 \end{pmatrix}^{3} = \begin{pmatrix} 1 & 0 & 0 \\ 0.5 & 0.375 & 0.125 \\ 0.375 & 0.5 & 0.125 \end{pmatrix}$$

d.

Solución

$$\begin{pmatrix} 0 & 0.1 & 0.9 \\ 0.7 & 0 & 0.3 \\ 1 & 0 & 0 \end{pmatrix}^{4} = \begin{pmatrix} 0.9409 & 0.003 & 0.0561 \\ 0.312 & 0.0679 & 0.6201 \\ 0.03 & 0.097 & 0.873 \end{pmatrix}$$

e.

Solución

$$\begin{pmatrix} 0 & 1 & 0 \\ 0.5 & 0 & 0.5 \\ 0 & 1 & 0 \end{pmatrix}^2 = \begin{pmatrix} 0.5 & 0 & 0.5 \\ 0 & 1 & 0 \\ 0.5 & 0 & 0.5 \end{pmatrix}$$

Solución

$$\begin{pmatrix} 0 & 1 & 0 \\ 0.5 & 0 & 0.5 \\ 0 & 1 & 0 \end{pmatrix} 8 = \begin{pmatrix} 0.5 & 0 & 0.5 \\ 0 & 1 & 0 \\ 0.5 & 0 & 0.5 \end{pmatrix}$$

7.

Absorbing Markov chains are when a state cannot be left, so when a probability of entering a state is not zero but the probability of staying in that state is 1, then it is an absorbing state.

Solución

$$\begin{pmatrix} 0.3 & 0.7 \\ 0.25 & 0.75 \end{pmatrix}^{10} = \begin{pmatrix} 0.26315... & 0.73684... \\ 0.26315... & 0.73684... \end{pmatrix}$$

Solución

$$\begin{pmatrix} 0.4 & 0.6 \end{pmatrix} \begin{pmatrix} 0.2631 & 0.7368 \\ 0.2631 & 0.7368 \end{pmatrix} = \begin{pmatrix} 0.2631 & 0.7368 \end{pmatrix}$$

Solución

$$\begin{pmatrix} 0.1 & 0.9 \end{pmatrix} \begin{pmatrix} 0.2631 & 0.7368 \\ 0.2631 & 0.7368 \end{pmatrix} = \begin{pmatrix} 0.2631 & 0.7368 \end{pmatrix}$$