

Math 231 — Hw 22

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1. Suppose you are modeling a chemical system where molecules of 2-butene can exist in either the cis or trans form. The transition matrix T describes the probabilities of converting from one form to the other every second.

$$T = \begin{pmatrix} 0.7 & 0.4 \\ 0.3 & 0.6 \end{pmatrix}$$

The first row and column correspond to the cis form, and the second row and column correspond to the trans form.

Compute the eigenvalues of this matrix. Based on your eigenvalues, which eigenvector space ends up being more important?

2. If 50% of the system is in cis form and 50% is in trans form, what is the predicted proportion after 60 seconds?
3. Consider a 2×2 diagonal matrix. Prove why the diagonal values are the eigenvalues and the standard normal basis is an eigenbasis.