

- (b) (5 Points) Assuming that there is some known total population of foxes and rabbits in the year 2000, **calculate what fraction of that total population is rabbits.** You can assume that 1000 years is a good approximation for an infinite amount of time.
- (c) (8 Points) In the far future, a curious child digs up a strange fossil in the park. It seems like Ancient Dino-foxes once inhabited the park! Using advanced future Zoologic-Mathematics, graduate students from the University of MegaCalifornia, Berkeley derive the following eigenvalue/eigenvector pairs describing the species interactions from the fossils:

$$\left(\lambda_1 = 1, \vec{v}_1 = \begin{bmatrix} 2 \\ -1 \end{bmatrix} \right), \left(\lambda_2 = 0.5, \vec{v}_2 = \begin{bmatrix} 1 \\ 1 \end{bmatrix} \right)$$

Reconstruct the state transition matrix.