

Eigenvalues of Leslie Matrices

Goals: Practice finding and interpreting eigenvalues and eigenvectors of Leslie matrices

1. Use Maple to find the eigenvalues for each of the matrices below:

$$(a) \ A = \begin{pmatrix} 0 & 30 & 70 \\ 0.6 & 0 & 0 \\ 0 & 0.1 & 0 \end{pmatrix}$$

$$(b) \ B = \begin{pmatrix} 0 & 5 & 15 \\ 0.19 & 0 & 0 \\ 0 & 0.12 & 0 \end{pmatrix}$$

$$(c) \ C = \begin{pmatrix} 0 & 5 & 10 \\ 0.07 & 0 & 0 \\ 0 & 0.1 & 0 \end{pmatrix}$$

$$(d) \ D = \begin{pmatrix} 0 & 4 & 9 \\ 0.19 & 0 & 0 \\ 0 & 0.12 & 0 \end{pmatrix}$$

2. Now find the eigenvector that corresponds to the dominant eigenvalue for each of the matrix in problem (1). Normalize the eigenvector so that the entries add up to 1. Interpret each vector in terms of populations.