

Maple Commands for Eigenvalues and Eigenvectors

with(linalg) :

$A := \text{matrix}(2, 2, [1, 2, -1, 4]);$

$$\begin{bmatrix} 1 & 2 \\ -1 & 4 \end{bmatrix} \quad (1)$$

$\text{eigenvects}(A);$

$$[2, 1, \left\{ \begin{bmatrix} 2 & 1 \end{bmatrix} \right\}], [3, 1, \left\{ \begin{bmatrix} 1 & 1 \end{bmatrix} \right\}] \quad (2)$$

$B := \text{matrix}(3, 3, [1, 3, 0, 1, 2, 1, 2, -1, 3]);$

$$\begin{bmatrix} 1 & 3 & 0 \\ 1 & 2 & 1 \\ 2 & -1 & 3 \end{bmatrix} \quad (3)$$

$\text{eigenvects}(B)$

$$[1, 2, \left\{ \begin{bmatrix} -1 & 0 & 1 \end{bmatrix} \right\}], [4, 1, \left\{ \begin{bmatrix} 1 & 1 & 1 \end{bmatrix} \right\}] \quad (4)$$

$C := \text{matrix}(3, 3, [2, -1, 2, 3, 4, 0, 0, 1, 2]);$

$$\begin{bmatrix} 2 & -1 & 2 \\ 3 & 4 & 0 \\ 0 & 1 & 2 \end{bmatrix} \quad (5)$$

$\text{eigenvects}(C)$

$$[4, 1, \left\{ \begin{bmatrix} 0 & 2 & 1 \end{bmatrix} \right\}], \left[2 + i\sqrt{3}, 1, \left\{ \begin{bmatrix} -1 - \frac{2}{3}i\sqrt{3} & i\sqrt{3} & 1 \end{bmatrix} \right\} \right], \left[2 - i\sqrt{3}, 1, \left\{ \begin{bmatrix} -1 + \frac{2}{3}i\sqrt{3} & -i\sqrt{3} & 1 \end{bmatrix} \right\} \right] \quad (6)$$

MATLAB Commands for Eigenvalues and Eigenvectors

>> $A = [1, 2; -1, 4]$

$A =$

$$\begin{bmatrix} 1 & 2 \\ -1 & 4 \end{bmatrix}$$

>> $[Va, Da] = \text{eig}(A)$

$Va =$

$$\begin{bmatrix} -0.8944 & -0.7071 \\ -0.4472 & -0.7071 \end{bmatrix}$$

$Da =$

$$\begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}$$

>> $B = [1, 3, 0; 1, 2, 1; 2, -1, 3]$

$$B =$$

$$\begin{bmatrix} 1 & 3 & 0 \\ 1 & 2 & 1 \\ 2 & -1 & 3 \end{bmatrix}$$

$$>> [Vb, Db] = eig(B)$$

$$Vb =$$

$$\begin{bmatrix} -0.5774 & -0.7071 & 0.7071 \\ -0.5774 & -0.0000 & -0.0000 \\ -0.5774 & 0.7071 & -0.7071 \end{bmatrix}$$

$$Db =$$

$$\begin{bmatrix} 4.0000 & 0 & 0 \\ 0 & 1.0000 & 0 \\ 0 & 0 & 1.0000 \end{bmatrix}$$

$$>> C = [2, -1, 2; 3, 4, 0; 0, 1, 2]$$

$$C =$$

$$\begin{bmatrix} 2 & -1 & 2 \\ 3 & 4 & 0 \\ 0 & 1 & 2 \end{bmatrix}$$

$$>> [Vc, Dc] = eig(C)$$

$$Vc =$$

$$\begin{bmatrix} 0.0000 + 0.0000i & -0.4588 + 0.3974i & -0.4588 - 0.3974i \\ -0.8944 + 0.0000i & 0.6882 + 0.0000i & 0.6882 + 0.0000i \\ -0.4472 + 0.0000i & 0.0000 - 0.3974i & 0.0000 + 0.3974i \end{bmatrix}$$

$$Dc =$$

$$\begin{bmatrix} 4.0000 + 0.0000i & 0.0000 + 0.0000i & 0.0000 + 0.0000i \\ 0.0000 + 0.0000i & 2.0000 + 1.7321i & 0.0000 + 0.0000i \\ 0.0000 + 0.0000i & 0.0000 + 0.0000i & 2.0000 - 1.7321i \end{bmatrix}$$