

> with(LinearAlgebra) : #some cleanup commands for LinearAlgebra

>

> A := Matrix(3, 3, [ 1.3, 0, 5.6,  
2.7, 1.2, 3,  
4, 5, 6 ]);

$$A := \begin{bmatrix} 1.3 & 0 & 5.6 \\ 2.7 & 1.2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \quad (1)$$

> Digits := 4 :

> Eigenvalues(A); # a mess

$$\begin{bmatrix} 10.7680758511128314 + 0.I \\ -1.13403792555641103 + 1.51551007395525294I \\ -1.13403792555641103 - 1.51551007395525294I \end{bmatrix} \quad (2)$$

> shorter := map(evalf, Eigenvalues(A)); #only keep 4 digits, as defined above

$$\text{shorter} := \begin{bmatrix} 10.77 + 0.I \\ -1.134 + 1.516I \\ -1.134 - 1.516I \end{bmatrix} \quad (3)$$

> map(Re, shorter); #extract the real parts – useful if you know your answers  
#are really real numbers...you could map Im to get imaginary parts

$$\begin{bmatrix} 10.77 \\ -1.134 \\ -1.134 \end{bmatrix} \quad (4)$$

> Eigenvectors(A); #a complex mess

$$\begin{bmatrix} 10.7680758511128314 + 0.I \\ -1.13403792555641103 + 1.51551007395525294I \\ -1.13403792555641103 - 1.51551007395525294I \end{bmatrix}, \left[ \left[ 0.470443814687963924 + 0.I, \right. \right. \quad (5)$$

0.790834358539555193 + 0.I, 0.790834358539555193 - 0.I],  
[ 0.382143255046380248 + 0.I, -0.207092740598693675 - 0.409553776713527272I,  
-0.207092740598693675 + 0.409553776713527272I],  
[ 0.795392450205804957 + 0.I, -0.343735860985420694 + 0.214020970927970872I,  
-0.343735860985420694 - 0.214020970927970872I ]]

> map(evalf, Eigenvectors(A)[1]);  
map(evalf, Eigenvectors(A)[2]);  
#eigenvectors outputs two items –  
#a column vector of eigenvalues, and a matrix whose columns are  
# the eigenvectors – here I want both to be simplified

$$\begin{bmatrix} 10.77 + 0.I \\ -1.134 + 1.516I \\ -1.134 - 1.516I \end{bmatrix} \quad (6)$$
$$\begin{bmatrix} 0.4704 + 0.I & 0.7908 + 0.I & 0.7908 - 0.I \\ 0.3821 + 0.I & -0.2071 - 0.4096I & -0.2071 + 0.4096I \\ 0.7954 + 0.I & -0.3437 + 0.2140I & -0.3437 - 0.2140I \end{bmatrix}$$

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