

Scilab has an inbuilt function called `spec(A)` to calculate the Eigenvalues of a Matrix A.

If you type,

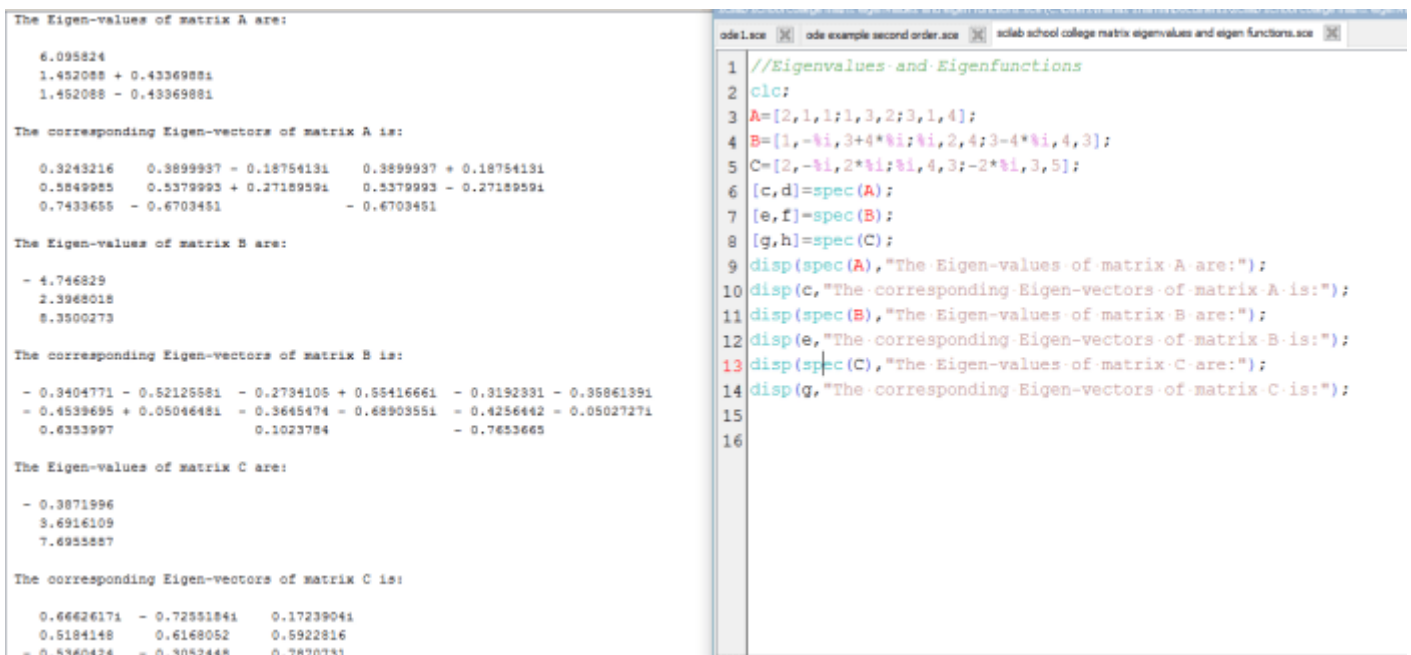
```
[c,d]=spec(A)
```

where d is a diagonal matrix which contains the eigen-values,
and c is a matrix that stores the eigen-vectors as it's columns.

The following code illustrates the use of the function `spec(A)` to print the eigenvalues and eigenvectors of Matrices.

```
//Eigenvalues and Eigenfunctions
clc;
A=[2,1,1;1,3,2;3,1,4];
B=[1,-%i,3+4*%i;%i,2,4;3-4*%i,4,3];
C=[2,-%i,2*%i;%i,4,3;-2*%i,3,5];
[c,d]=spec(A);
[e,f]=spec(B);
[g,h]=spec(C);
disp(spec(A),"The Eigen-values of matrix A are:");
disp(c,"The corresponding Eigen-vectors of matrix A is:");
disp(spec(B),"The Eigen-values of matrix B are:");
disp(e,"The corresponding Eigen-vectors of matrix B is:");
disp(spec(C),"The Eigen-values of matrix C are:");
disp(g,"The corresponding Eigen-vectors of matrix C is:");
```

Output:



The screenshot shows the SCILAB interface with two windows. The left window displays the output of the code, and the right window shows the code being executed.

Output Window:

```
The Eigen-values of matrix A are:
6.095824
1.452088 + 0.43369881i
1.452088 - 0.43369881i

The corresponding Eigen-vectors of matrix A is:
0.3243216 0.3899937 - 0.18754131 0.3899937 + 0.18754131i
0.5849985 0.5379993 + 0.27189591i 0.5379993 - 0.27189591i
0.7493655 - 0.6703451i - 0.6703451i

The Eigen-values of matrix B are:
- 4.746829
2.3968018
8.3500273

The corresponding Eigen-vectors of matrix B is:
- 0.3404771 - 0.52125581i - 0.2784105 + 0.58416661i - 0.3192331 - 0.35861391i
- 0.4539695 + 0.05046481i - 0.3645474 - 0.48903551i - 0.4256442 - 0.05027271i
0.6353997 0.1023784 - 0.7653665i

The Eigen-values of matrix C are:
- 0.3871996
3.6916109
7.6955887

The corresponding Eigen-vectors of matrix C is:
0.66626171 - 0.72551841i 0.17239041i
0.5184148 0.6168052 0.5922816
- 0.5360424 - 0.3052448i 0.7870731i
```

Code Window:

```
1 //Eigenvalues and Eigenfunctions
2 clc;
3 A=[2,1,1;1,3,2;3,1,4];
4 B=[1,-%i,3+4*%i;%i,2,4;3-4*%i,4,3];
5 C=[2,-%i,2*%i;%i,4,3;-2*%i,3,5];
6 [c,d]=spec(A);
7 [e,f]=spec(B);
8 [g,h]=spec(C);
9 disp(spec(A),"The Eigen-values of matrix A are:");
10 disp(c,"The corresponding Eigen-vectors of matrix A is:");
11 disp(spec(B),"The Eigen-values of matrix B are:");
12 disp(e,"The corresponding Eigen-vectors of matrix B is:");
13 disp(spec(C),"The Eigen-values of matrix C are:");
14 disp(g,"The corresponding Eigen-vectors of matrix C is:");
15
16
```

Video:



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I'm a physicist specializing in theoretical, computational and experimental condensed matter physics. I like to develop Physics related apps and softwares from time to time. Can code in most of the popular languages. Like to share my knowledge in Physics and applications using this Blog and a YouTube channel.

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