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Course: B.Sc(H) Physics Sem-5

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Aim:To find the smallest eigenvalue and corresponding eigenvector of a given vmatrix using spec() function

Source Code:

clc

clear

A=input("input matrix A=")

disp(A,"A=")

[d,v]=spec(A)

disp(d,"Eigenvectors=")

disp(v,"Eigenvalues=")

Output:

input matrix A=[0 11 -5; -2 17 -7; -4 26 -10]

A=

0. 11. -5.

-2. 17. -7.

-4. 26. -10.

Eigenvectors=

-0.4082483 0.2182179 -0.3244428

-0.4082483 0.4364358 -0.4866643

-0.8164966 0.8728716 -0.8111071

Eigenvalues=

1. 0. 0.

0. 2. 0.

0. 0. 4.

input matrix A=[2 1 1; 1 3 2; 3 1 4]

A=

2. 1. 1.

1. 3. 2.

3. 1. 4.

Eigenvectors=

0.3243216 0.3899937 - 0.1875413i 0.3899937 + 0.1875413i

0.5849985 0.5379993 + 0.2718959i 0.5379993 - 0.2718959i

0.7433655 -0.6703451 -0.6703451

Eigenvalues=

6.095824 0. 0.

0. 1.452088 + 0.4336988i 0.

0. 0. 1.452088 - 0.4336988i

input matrix A=[1 -%i 3+4\*%i; %i 2 4; 3-4\*%i 4 3]

A=

1. -i 3. + 4.i

i 2. 4.

3. - 4.i 4. 3.

Eigenvectors=

-0.3404771 - 0.5212558i -0.2734105 + 0.5541666i -0.3192331 - 0.3586139i

-0.4539695 + 0.0504648i -0.3645474 - 0.6890355i -0.4256442 - 0.0502727i

0.6353997 0.1023784 -0.7653665

Eigenvalues=

-4.746829 0. 0.

0. 2.3968018 0.

0. 0. 8.3500273

input matrix A=[2 -%i 2\*%i; %i 4 3; -2\*%i 3 5]

A=

2. -i 2.i

i 4. 3.

-2.i 3. 5.

Eigenvectors=

0.6662617i -0.7255184i 0.1723904i

0.5184148 0.6168052 0.5922816

-0.5360424 -0.3052448 0.7870731

Eigenvalues=

-0.3871996 0. 0.

0. 3.6916109 0.

0. 0. 7.6955887