Name: Shailja Kant Tiwarri

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

Roll NO.-81

Aim:Verify that eige vectors of Hermitian matrix are orthogonal i.e X’Y=0 where X & Y are eigenn vectors of Hermitiann matrix and X’ is transpose conjugate of X.

Source Code:

clc

clear

A=[1 2+3\*%i 3+%i; 2-3\*%i 2 1-2\*%i; 3-%i 1+2\*%i 5]

disp(A,"A=")

[d,v]=spec(A)

disp(d,"Eigenvectors=")

v1=d(:,1)

v2=d(:,2)

v3=d(:,3)

disp(v1,"v1=")

disp(v2,"v2=")

disp(v3,"v3=")

if v1'\*v2~=0 then

disp("v1 & v2 are orthogoal eigen vectors")

else disp("v1 & v2 are not orthogoal eigen vectors")

end

if v1'\*v3~=0 then

disp("v1 & v3 are orthogoal eigen vectors")

else disp("v1 & v3 are not orthogoal eigen vectors")

end

if v3'\*v2~=0 then

disp("v3 & v2 are orthogoal eigen vectors")

else disp("v3 & v2 are not orthogoal eigen vectors")

end

Output:

A=

1. 2. + 3.i 3. + i

2. - 3.i 2. 1. - 2.i

3. - i 1. + 2.i 5.

Eigenvectors=

-0.5452372 - 0.5637704i 0.3475738 - 0.0715136i 0.4985735 + 0.1018927i

0.5823035 - 0.0185332i 0.4906009 - 0.4190874i 0.2947881 - 0.3966808i

0.21321 -0.6765758 0.704831

v1=

-0.5452372 - 0.5637704i

0.5823035 - 0.0185332i

0.21321

v2=

0.3475738 - 0.0715136i

0.4906009 - 0.4190874i

-0.6765758

v3=

0.4985735 + 0.1018927i

0.2947881 - 0.3966808i

0.704831

v1 & v2 are orthogoal eigen vectors

v1 & v3 are orthogoal eigen vectors

v3 & v2 are orthogoal eigen vectors