Computer Engineering Department &
Information Technology Engineering Department

Academic Year: 2021-2022

Class: S.Y.B.Tech **Sem.:** 4 **Course:** Linear Algebra

Name	Pratik Pujari		
UID no.	2020300054	Class:	Comps C Batch
Experiment No.	8		

AIM:	To find the eigen values and eigen vectors
PROBLEM	
CODE:	(see below)

```
printf("\n")

A=input("Enter the matrix: ")

[x,R]=spec(A)
[x1,y1]=size(A)
b=zeros(x1,1)
printf("The eigen values are\n")
for i=1:x1
    printf(" %d, ",R(i,i))
end
[m,n]=size(R)

function x=calAM(R, x1)
    occ=zeros(x1,1)
    for i=1:x1
        for j=1:x1
            if R(i,i) == R(j,j)
                occ(i,1)=occ(i,1)+1
            end
        end
    end
    for i=1:x1
        for j=1:x1
            if occ(i,1)>occ(j,1)
                x =occ(i,1)
```

Computer Engineering Department & Information Technology Engineering Department

Academic Year: 2021-2022

Class: S.Y.B.Tech   **Sem.:** 4 **Course:** Linear Algebra

	```scilab end end end endfunction for i=1:m eigenVal=R(i,i); [X, n1] = linsolve(A - R(i,i)*eye(m,m),b) printf("\n\nEigen vectors for eigen value %d",eigenVal) disp(n1) [row, col] = size(n1) printf("\nGeometric multiplicity is: %d\n", col) c=calAM(R,x1) printf("Algebraic multiplicity is: %d\n",c) if col == c printf("Matrix is Diagonisable") else printf("Matrix is Non Diagonisable") end end ```
OUTPUT TABLE:	``` Enter the matrix: [2,1,1;1,2,1;0,0,1] The eigen values are 3, 1, 1, ```

Computer Engineering Department &
Information Technology Engineering Department

Academic Year: 2021-2022

Class: S.Y.B.Tech   **Sem.:** 4 **Course:** Linear Algebra

```
Eigen vectors for eigen value 3
    0.7071068
    0.7071068
   -1.084D-16

Geometric multiplicity is: 1
Algebraic multiplicity is: 2
Matrix is Non Diagonisable

Eigen vectors for eigen value 1
    0.8164966   -2.627D-16
   -0.4082483   -0.7071068
   -0.4082483    0.7071068

Geometric multiplicity is: 2
Algebraic multiplicity is: 2
Matrix is Diagonisable

Eigen vectors for eigen value 1
    0.8164966   -2.627D-16
   -0.4082483   -0.7071068
   -0.4082483    0.7071068

Geometric multiplicity is: 2
Algebraic multiplicity is: 2
Matrix is Diagonisable
--> |
```

RESULT: Learnt about eigen values and eigen vectors, also learnt how to find the values using the spec function. Learnt how to find the eigen vectors using the linsolve functions and also found out the algebraic and geometric multiplicity of the eigen values.