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**2022300118**

**SE-Comps B/Batch C**

**4th April 2024**

# Scilab no.9 : Eigen-vectors

**Program No.1** :- Write a scilab code to find Eigen values and eigen vectors of matrix A

$$A=\begin{bmatrix}2 & -1 & 1\\ 1 & 2 & -1\\ 1 & -1 & 2\end{bmatrix}$$

**Code :-**

```
clc;
A = [2 -1 1; 1 2 -1; 1 -1 2];
[c, d] = spec(A);
printf("The Eigen-Values of matrix A are : ");
disp(spec(A));
printf("The Eigen-Vectors of matrix A are : ");
disp(c);
```

**Output :-**

```
Scilab 6.1.1 Console
The Eigen-Values of matrix A are :
   2. + 0.i
   1. + 0.i
   3. + 0.i
The Eigen-Vectors of matrix A are :
   0.5773503 + 0.i    2.621D-16 + 0.i    0.7071068 + 0.i
   0.5773503 + 0.i   -0.7071068 + 0.i    2.604D-16 + 0.i
   0.5773503 + 0.i   -0.7071068 + 0.i    0.7071068 + 0.i

-->
```

**Program No.2** :- Write a scilab code to find Eigen values and eigen vectors of matrix A

$$A=\begin{bmatrix}8 & -8 & -2\\ 4 & -3 & -2\\ 3 & -4 & 1\end{bmatrix}$$

**Code :-**

```
clc;
A = [8 -8 -2; 4 -3 -2; 3 -4 1];
[c, d] = spec(A);
printf("The Eigen-Values of matrix A are : ");
disp(spec(A));
printf("The Eigen-Vectors of matrix A are : ");
disp(c);
```

**Output :-**

Scilab 6.1.1 Console

```
The Eigen-Values of matrix A are :
   1. + 0.i
   3. + 0.i
   2. + 0.i
The Eigen-Vectors of matrix A are :
  -0.7427814 + 0.i  -0.8164966 + 0.i  -0.8017837 + 0.i
  -0.557086  + 0.i  -0.4082483 + 0.i  -0.5345225 + 0.i
  -0.3713907 + 0.i  -0.4082483 + 0.i  -0.2672612 + 0.i

-->
```

**Program No.3** :- Write a scilab code to find Eigen values and eigen vectors of matrix A

$$A=\begin{bmatrix}2 & 2 & 1\\ 1 & 3 & 1\\ 1 & 2 & 2\end{bmatrix}$$

**Code :-**

```
clc;
A = [2 2 1; 1 3 1; 1 2 2];
[c, d] = spec(A);
printf("The Eigen-Values of matrix A are : ");
disp(spec(A));
printf("The Eigen-Vectors of matrix A are : ");
disp(c);
```

**Output :-**

Scilab 6.1.1 Console

```
The Eigen-Values of matrix A are :
   1. + 0.i
   5. + 0.i
   1. + 0.i
The Eigen-Vectors of matrix A are :
  -0.904534  + 0.i   0.5773503 + 0.i   0.1431312 + 0.i
   0.3015113 + 0.i   0.5773503 + 0.i  -0.4989347 + 0.i
   0.3015113 + 0.i   0.5773503 + 0.i   0.8547383 + 0.i

-->
```

**Program No.4** :- Write a scilab code to find Eigen values and eigen vectors of matrix A

$A = \begin{bmatrix} 4 & -2 \\ 1 & 1 \end{bmatrix}$

**Code :-**

```
clc;
A = [4 -2; 1 1];
[c, d] = spec(A);
printf("The Eigen-Values of matrix A are : ");
disp(spec(A));
printf("The Eigen-Vectors of matrix A are : ");
disp(c);
```

**Output :-**

Scilab 6.1.1 Console

```
The Eigen-Values of matrix A are :
   3. + 0.i
   2. + 0.i
The Eigen-Vectors of matrix A are :
   0.8944272 + 0.i   0.7071068 + 0.i
   0.4472136 + 0.i   0.7071068 + 0.i

-->
```

**Program No.5** :- Write a scilab code to find Eigen value of matrix A

$$A=\begin{bmatrix}2 & 1 & 1\\ 2 & 3 & 2\\ 3 & 3 & 4\end{bmatrix}$$

**Code :-**

```
clc;
A = [2 1 1;2 3 2;3 3 4];
[c, d] = spec(A);
printf("The Eigen-Values of matrix A are : ");
disp(spec(A));
printf("The Eigen-Vectors of matrix A are : ");
disp(c);
```

**Output :-**

Scilab 6.1.1 Console

```
The Eigen-Values of matrix A are :
   7. + 0.i
   1. + 0.i
   1. + 0.i
The Eigen-Vectors of matrix A are :
  -0.2672612 + 0.i  -0.8111071 + 0.i   0.1180346 + 0.i
  -0.5345225 + 0.i   0.3244428 + 0.i  -0.7586964 + 0.i
  -0.8017837 + 0.i   0.4866643 + 0.i   0.6406618 + 0.i

-->
```

**Program No.6** :- Write a scilab code to find Eigen value of matrix A

$$A=\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$

**Code :-**

```
clc;
A = [8 -6 2;-6 7 -4;2 -4 3];
[c, d] = spec(A);
printf("The Eigen-Values of matrix A are : ");
disp(spec(A));
printf("The Eigen-Vectors of matrix A are : ");
disp(c);
```

**Output :-**

Scilab 6.1.1 Console

```
The Eigen-Values of matrix A are :
   1.584D-15
   3.0000000
   15.
The Eigen-Vectors of matrix A are :
   0.3333333   0.6666667  -0.6666667
   0.6666667   0.3333333   0.6666667
   0.6666667  -0.6666667  -0.3333333

-->
```