
Matrix Diagonalization

Experiment no - 1 :

```
clc
clear all
a=input('Enter a given matrix. ');
[X D]=eig(a);
out=isequal(a,a');
if(out==0)
    M=X
    D=inv(M)*a*M
else
    M=X
    D=M'*a*M
end
```

Output 1 :-

Enter a given matrix.[2 3 8;5 6 5;7 1 2]

M =

```
0.7330 -0.5317 0.1826
-0.0231 -0.7333 -0.9129
-0.6798 -0.4237 0.3651
```

D =

```
-5.5139 -0.0000 0.0000
0.0000 12.5139 -0.0000
```

-0.0000 -0.0000 3.0000

Output 2 :-

Enter a given matrix.[2 0 1;0 2 0;1 0 2]

M =

0.7071 0 0.7071
0 -1.0000 0
-0.7071 0 0.7071

D =

1.0000 0 -0.0000
0 2.0000 0
0.0000 0 3.0000

Experiment No :- 2

```
clc
clear all
a=input('Enter a given matrix. ');
b=input('Enter the power to which this
should be raised ');
[X D]=eig(a);
out=isequal(a,a');
M=X;
if (out==0)
    D=inv(M)*a*M;
```

```

        S=M* (D^b) *inv (M)
else
    D=M' *a*M;
    S=M* (D^b) *M'
end

```

Output 1:-

Enter a given matrix.[2 3 8;5 6 5;7 1 2]

Enter the power to which this should be raised2

S =

```

75.0000  32.0000  47.0000
75.0000  56.0000  80.0000
33.0000  29.0000  65.0000

```

Output 2 :-

Enter a given matrix.[2 0 1;0 2 0;1 0 2]

Enter the power to which this should be raised2

S =

```

5.0000    0  4.0000
    0  4.0000    0
4.0000    0  5.0000

```