

Assignment 2

Question

Find the order, minimum order, rank, determinant, inverse, eigen values and eigen

vectors of the matrix $\begin{bmatrix} -1 & 0 & 3 & 0 \\ -4 & 0 & 1 & 3 \\ 3 & 4 & 0 & 1 \\ 4 & 0 & 1 & 3 \end{bmatrix}$.

Code

```

1  A = [-1 0 3 0; -4 0 1 3; 3 4 0 1; 4 0 1 3];
2  disp('Matrix = ');
3  disp(A);
4  order = size(A);
5  disp('Order = ');
6  disp(order);
7  n = min(order);
8  disp('Minimum Order = ');
9  disp(n);
10 rank_of_matrix = rank(A);
11 disp('Rank = ');
12 disp(rank_of_matrix);
13 determinant_of_matrix = det(A);
14 disp('Determinant = ');
15 disp(determinant_of_matrix);
16 if (determinant_of_matrix ~= 0)
17     inverse = inv(A);
18     disp('Inverse = ');
19     disp(inverse)
20 else
21     disp('Inverse does not exist')
22 end
23 [eigen_value, eigen_vector]= eig(A);
24 disp('Eigen Values = ');
25 disp(eigen_value);
26 disp('Eigen Vectors = ');
27 disp(eigen_vector);

```

Output

```
>> Assignment_2
Matrix =
    -1     0     3     0
    -4     0     1     3
     3     4     0     1
     4     0     1     3

Order =
     4     4

Minimum Order =
     4

Rank =
     4

Determinant =
    -288

Inverse =
     0    -0.1250     0     0.1250
  0.0278    0.0486    0.2500   -0.1319
  0.3333   -0.0417     0     0.0417
 -0.1111    0.1806     0     0.1528

Eigen Values =
 -0.4673 + 0.0000i    0.2833 + 0.2500i    0.2833 - 0.2500i
 0.2630 + 0.0000i
 -0.5634 + 0.0000i   -0.6278 + 0.0000i   -0.6278 + 0.0000i
 0.3236 + 0.0000i
  0.6656 + 0.0000i   -0.0631 + 0.4605i   -0.0631 - 0.4605i
 0.5424 + 0.0000i
  0.1455 + 0.0000i    0.1804 - 0.4632i    0.1804 + 0.4632i
 0.7293 + 0.0000i

Eigen Vectors =
 -5.2734 + 0.0000i    0.0000 + 0.0000i    0.0000 + 0.0000i
 0.0000 + 0.0000i
  0.0000 + 0.0000i    1.0436 + 3.0727i    0.0000 + 0.0000i
 0.0000 + 0.0000i
  0.0000 + 0.0000i    0.0000 + 0.0000i    1.0436 - 3.0727i
 0.0000 + 0.0000i
```

Date of Assignment: 13.01.2025

Date of Submission: 24.02.2025

```
0.0000 + 0.0000i    0.0000 + 0.0000i    0.0000 + 0.0000i
5.1862 + 0.0000i
```

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>>
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