EXPERIMENT – 2   DATE :

Write a Program to find minimum & maximum elements of the matrix, trace, rank, eigenvalues, and eigenvectors of the given matrix.

Aim :

To find minimum & maximum elements of the matrix, trace, rank, eigenvalues, and eigenvectors of the given matrix.

Requirements :

Python Version, Python Environment (Jupyter Notebook, Google Colab), Numpy library.

Code :

```python
import numpy as np

def matrix_operations(matrix):

    min_element = np.min(matrix)

    max_element = np.max(matrix)

    print("Minimum element:", min_element)

    print("Maximum element:", max_element)

    trace = np.trace(matrix)

    print("Trace:", trace)

    rank = np.linalg.matrix_rank(matrix)

    print("Rank:", rank)

    eigenvalues, eigenvectors = np.linalg.eig(matrix)

    print("Eigenvalues:", eigenvalues)
```

```
    print("Eigenvectors:", eigenvectors)
```

```
matrix = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])
```

```
matrix_operations(matrix)
```

Output :

Minimum element: 1

Maximum element: 9

Trace: 15

Rank: 2

Eigenvalues: [1.61168440e+01 -1.11684397e+00 -1.30367773e-15]

Eigenvectors: [[-0.23197069 -0.78583024 0.40824829]

 [-0.52532209 -0.08675134 -0.81649658]

 [-0.8186735   0.61232756 0.40824829]]

Result :

The above program is successfully executed and produced the maximum and minimum element of the matrix, trace, rank, Eigenvalues, Eigenvectors of the given matrix.