Experiment : 02

Objective: Program to implement numpy libraries for performing various metrics operation import numpy as np.

Code:

```
# Import NumPy library
import numpy as np

# Creating two matrices
A = np.array([[4, 2],
              [3, 1]])
B = np.array([[1, 5],
              [2, 6]])

#Matrix Addition
add = np.add(A, B)
print("\nMatrix Addition (A + B):\n", add)

#Matrix Subtraction
sub = np.subtract(A, B)
print("\nMatrix Subtraction (A - B):\n", sub)

#Matrix Multiplication
mul = np.dot(A, B)
print("\nMatrix Multiplication (A × B):\n", mul)

#Element-wise Multiplication
elem_mul = np.multiply(A, B)
print("\nElement-wise Multiplication:\n", elem_mul)

#Transpose of Matrix
transpose = np.transpose(A)
print("\nTranspose of Matrix A:\n", transpose)

#Inverse of Matrix
inverse = np.linalg.inv(A)
print("\nInverse of Matrix A:\n", inverse)

#Rank of Matrix
rank = np.linalg.matrix_rank(A)
print("\nRank of Matrix A:\n", rank)
```

```
#Trace of Matrix
trace = np.trace(A)
print("\nTrace of Matrix A:\n", trace)
```

Output:

```
Matrix A:
 [[4 2]
 [3 1]]
Matrix B:
 [[1 5]
 [2 6]]

Matrix Addition (A + B):
 [[5 7]
 [5 7]]

Matrix Subtraction (A - B):
 [[ 3 -3]
 [ 1 -5]]

Matrix Multiplication (A × B):
 [[ 8 32]
 [ 5 21]]

Element-wise Multiplication:
 [[ 4 10]
 [ 6  6]]

Transpose of Matrix A:
 [[4 3]
 [2 1]]

Inverse of Matrix A:
 [[-0.5  1. ]
 [ 1.5 -2. ]]

Rank of Matrix A:
 2

Trace of Matrix A:
 5
```