# Experiment No.: 1

# Aim

Matrix operations (using vectorization) and transformation using python and SVD using Python.
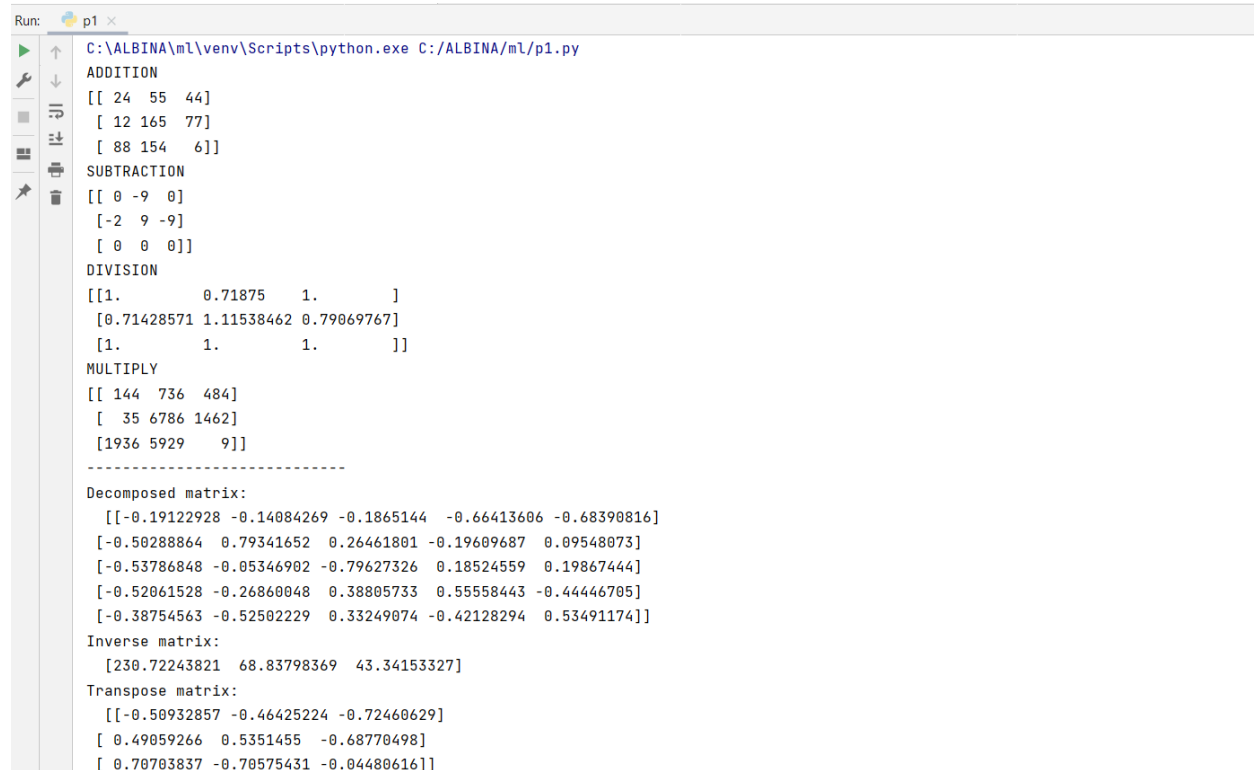
# CO1

Use different python packages to perform numerical calculations, statistical computations and data visualization

## Procedure

```
import numpy as np
mat1=np.array([[12,23,22],[5,87,34],[44,77,3]])
mat2=np.array([[12,32,22],[7,78,43],[44,77,3]])
print('ADDITION')
print(np.add(mat1,mat2))
print('SUBTRACTION')
print(np.subtract(mat1,mat2))
print('DIVISION')
print(np.divide(mat1,mat2))
print('MULTIPLY')
print(np.multiply(mat1,mat2))
print("----------------------------")
from numpy import array
from scipy.linalg import svd
A = array([[12, 21, 39], [94, 75, 46], [37, 80, 94], [64, 34, 99], [38, 12, 89]])
U, s, VT = svd(A)
print('Decomposed matrix:\n ', U)
print('Inverse matrix:\n ', s)
print('Transpose matrix:\n ', VT)
```

### Output Screenshot

```
Run:     p1 ×
         C:\ALBINA\ml\venv\Scripts\python.exe C:/ALBINA/ml/p1.py
         ADDITION
         [[ 24  55  44]
          [ 12 165  77]
          [ 88 154   6]]
         SUBTRACTION
         [[ 0 -9  0]
          [-2  9 -9]
          [ 0  0  0]]
         DIVISION
         [[1.         0.71875    1.        ]
          [0.71428571 1.11538462 0.79069767]
          [1.         1.         1.        ]]
         MULTIPLY
         [[ 144  736  484]
          [  35 6786 1462]
          [1936 5929    9]]
         ----------------------------
         Decomposed matrix:
          [[-0.19122928 -0.14084269 -0.1865144  -0.66413606 -0.68390816]
          [-0.50288864  0.79341652  0.26461801 -0.19609687  0.09548073]
          [-0.53786848 -0.05346902 -0.79627326  0.18524559  0.19867444]
          [-0.52061528 -0.26860048  0.38805733  0.55558443 -0.44446705]
          [-0.38754563 -0.52502229  0.33249074 -0.42128294  0.53491174]]
         Inverse matrix:
          [230.72243821  68.83798369  43.34153327]
         Transpose matrix:
          [[-0.50932857 -0.46425224 -0.72460629]
          [ 0.49059266  0.5351455  -0.68770498]
          [ 0.70703837 -0.70575431 -0.04480616]]
```

### Result

The program was executed and the result was successfully obtained. Thus CO1 was obtained.