**PROGRAM 1**

**PROGRAM TO COMPUTE ALL MATRIX OPERATION USING NUMPY**

import numpy as np

M1 = np.array([[5, -10, 15], [3, -6, 9], [-4, 8, 12]])

M2 = np.array([[12,13,15],[15,45,65],[45,87,89]])

M3 = M1 + M2

M4 = M1 - M2

M5 = M1.dot(M2)

M6 = M5.transpose()

M7 = np.divide(M5,M6)

print("addition :",M3)

print("substraction :",M4)

print("multiplication :",M5)

print("transpose:",M6)

print("division:",M7)

**output**

addition : [[ 17   3  30]

 [ 18  39  74]

 [ 41  95 101]]

substraction : [[ -7 -23   0]

 [-12 -51 -56]

 [-49 -79 -77]]

multiplication : [[ 585  920  760]

 [ 351  552  456]

 [ 612 1352 1528]]

transpose: [[ 585  351  612]

 [ 920  552 1352]

 [ 760  456 1528]]

division: [[1.         2.62108262 1.24183007]

 [0.38152174 1.         0.33727811]

 [0.80526316 2.96491228 1.        ]]

1.PROGRAM

from numpy import array

from scipy.linalg import svd

A = array([ [12,15,46],[12,45,78],[45,56,78]])

print(A)

U ,s,vt = svd(A)

print (U)

print(s)

print(vt)

OUTPUT

[[12 15 46]

 [12 45 78]

 [45 56 78]]

[[-0.33198016 -0.31079271 -0.89061611]

 [-0.6125029  -0.64701962  0.4540989 ]

 [-0.71737673  0.69625678  0.02443624]]

[146.12074303  23.02253424  10.08421404]

[[-0.29849116 -0.49763934 -0.81440661]

 [ 0.86166913  0.22641322 -0.45416226]

 [-0.41040143  0.83731245 -0.36121811]]

Process finished with exit code 0