A-9 Write a **Python** program to compute following computation on matrix:

a)Addition of two matrices

1. Subtraction of two matrices
2. Multiplication of two matrices

d) Transpose of a matrix

Program 1

def add(m1,m2):

result = [[0,0,0],

[0,0,0],

[0,0,0]]

for i in range(len(m1)):

for j in range(len(m1[0])):

result[i][j] = m1[i][j] + m2[i][j]

for r in result:

print(r)

def mult(m1,m2):

result = [[0,0,0],

[0,0,0],

[0,0,0]]

for i in range(len(m1)):

for j in range(len(m2[0])):

for k in range(len(m2)):

result[i][j] += m1[i][k] \* m2[k][j]

for r in result:

print(r)

def sub(m1,m2):

result = [[0,0,0],

[0,0,0],

[0,0,0]]

for i in range(len(m1)):

for j in range(len(m1[0])):

result[i][j] = m1[i][j] - m2[i][j]

for r in result:

print(r)

def tran(m1):

result = [[0,0,0],

[0,0,0],

[0,0,0]]

for i in range (len (m1)):

for j in range (len (m1[0])):

result [j][i] = m1 [i][j]

for r in result:

print (r)

m1 = []

print("Enter 1st matrix m1 :")

r1 = int(input("Enter the number of rows:"))

c1 = int(input("Enter the number of columns:"))

print("Enter the entries rowwise:")

for i in range(r1):

a1 =[]

for j in range(c1):

a1.append(int(input()))

m1.append(a1)

for i in range(r1):

for j in range(c1):

print(m1[i][j], end = " ")

print()

m2 = []

print("Enter 2nd matrix m2 :")

r2 = int(input("Enter the number of rows:"))

c2 = int(input("Enter the number of columns:"))

print("Enter the entries rowwise:")

for i in range(r2):

a2 =[]

for j in range(c2):

a2.append(int(input()))

m2.append(a2)

for i in range(r2):

for j in range(c2):

print(m2[i][j], end = " ")

print()

print("The 1st matrix m1 is :",m1)

print("The 2nd matrix m2 is :",m2)

flag=1

while flag==1:

print("\n\n--------------------MENU--------------------\n")

print("1. Addition of two matrices")

print("2. Subtraction of two matrices")

print("3. Multiplication of two matrices")

print("4. Transpose of matrix")

print("5. Exit\n")

ch=int(input("Enter your Choice (from 1 to 5) :"))

if ch==1:

print("Addition of two matrices is :")

add(m1,m2)

a = input("Do you want to continue (y/n) :")

if a == "y":

flag = 1

else:

flag = 0

print("Thanks for using this program!")

elif ch==2:

print("Subtraction of two matrices is :")

sub(m1,m2)

a = input("Do you want to continue (y/n) :")

if a == "y":

flag = 1

else:

flag = 0

print("Thanks for using this program!")

elif ch==3:

print("Multiplication of two matrices is :")

mult(m1,m2)

a = input("Do you want to continue (y/n) :")

if a == "y":

flag = 1

else:

flag = 0

print("Thanks for using this program!")

elif ch==4:

print("Transpose of matrix m1 is :")

tran(m1)

a = input("Do you want to continue (y/n) :")

if a == "y":

flag = 1

else:

flag = 0

print("Thanks for using this program!")

elif ch==5:

flag=0

print("Thanks for using this program!")

else:

print("!!Wrong Choice!! ")

a=input("Do you want to continue (yes/no) :")

if a=="yes":

flag=1

else:

flag=0

print("Thanks for using this program!")

Program 2 -using numpy library

import numpy

# initializing matrices

x = numpy.array([[1, 2], [4, 5]])

y = numpy.array([[7, 8], [9, 10]])

# using add() to add matrices

print("The element wise addition of matrix is : ")

print(numpy.add(x, y))

# using subtract() to subtract matrices

print("The element wise subtraction of matrix is : ")

print(numpy.subtract(x, y))

# using dot() to multiply matrices

print ("The product of matrices is : ")

print (numpy.dot(x,y))

# using "T" to transpose the matrix

print("The transpose of given matrix is : ")

print(x.T)

print(y.T)