

Assignment no.3

Code :

```
def accept_mat(M):
    r=int(input('Enter the value of the row: '))
    c=int(input('Enter the value of the column: '))
    print("\n    Matrix Elements are")
    for i in range(r):
        A=[]
        for j in range(c):
            A.append(int(input("\t")))
        M.append(A)
```

```
def display_mat(m,r,c):
    print("\n    Matrix is: ")
    for i in range(r):
        for j in range(c):
            print(" ",m[i][j],end=" ")
        print("\n")
```

```
def displaytrans_mat(m,r,c):
    print("\n    Matrix is: ")
    for i in range(c):
        for j in range(r):
            print(" ",m[i][j],end=" ")
        print("\n")
```

```
def Addition(m1,m2,m3,r,c):
    for i in range(r):
        A=[]
        for j in range(c):
            A.append(m1[i][j]+m2[i][j])
        m3.append(A)
```

```
def Subtraction(m1,m2,m3,r,c):  
for i in range(r):  
    A=[]  
    for j in range(c):  
        A.append(m1[i][j]-m2[i][j])  
    m3.append(A)
```

```
def transpose_mat(m,m1,r,c):  
for i in range(c):  
    B=[]  
    for j in range(r):  
        B.append(m[j][i])  
    m1.append(B)
```

```
def transposerec_mat(m,m1,r,c):  
for i in range(c):  
  
    for j in range(r):  
        m1[i][j] = m[j][i]
```

```
def multiplication_mat(M1,M2,M3,r1,c1,c2) :  
for i in range(r1) :  
    A = []  
    for j in range(c2) :  
        sum = 0  
        for k in range(c1) :  
            sum = sum + (M1[i][k] * M2[k][j])  
        A.append(sum)  
    M3.append(A)
```

```
def main():  
while True:
```

```
    a = int(input("Enter 1 to start new and 2 to exit: "))
```

```

if (a==1):
    print("\n New loop  starts")
    MAT=[]
    MAT1=[]
    MAT2=[]
    MAT3=[]
    MAT4=[]
    MAT5=[]
    MAT6=[]

    print("First Matrix:")
    accept_mat(MAT)
    r1=len(MAT)
    c1=len(MAT[0])
    display_mat(MAT,r1,c1)

    print("Second Matrix:")
    accept_mat(MAT1)
    r2=len(MAT1)
    c2=len(MAT1[0])
    display_mat(MAT1,r2,c2)

while True:
    print ("\t1 : Enter 1 Addition of Matrix:")
    print ("\t2 : Enter 2 Subtraction of Matrix :")
    print ("\t3 : Enter 3 Transpose of Matrix:")
    print ("\t4 : Enter 4 Multiplication of Matrix:")
    print ("\t5 : Exit")
    ch = int(input("Enter your choice : "))
    if (ch==1):
        if(r1==r2 and c1==c2):
            Addition(MAT,MAT1,MAT2,r1,c1)
            print("ADDITION OF MATRIX IS : ")
            display_mat(MAT2,r1,c1)
        else:

```

```
print("ADDITION OF MATRIX CANNOT BE  
PERFORMED")
```

```
elif(ch==2) :
```

```
if(r1==r2 and c1==c2):
```

```
Subtraction(MAT,MAT1,MAT3,r1,c1)
```

```
print("Subtraction OF MATRIX IS : ")
```

```
display_mat(MAT3,r1,c1)
```

```
else:
```

```
print("Subtraction OF MATRIX CANNOT BE  
PERFORMED")
```

```
elif(ch==3):
```

```
ph = int(input("Enter 1 for transpose of First Matrix and 2  
for Second: "))
```

```
if(ph==1):
```

```
print("Transpose of first matrix is: ")
```

```
if(r1!=c1) :
```

```
print("\n TRANSPOSE OF RECTANGULAR  
MATRIX IS : ")
```

```
MAT4= [[0 for x in range(r1)] for y in range(c1)]
```

```
transposerec_mat(MAT,MAT4,r1,c1)
```

```
displaytrans_mat(MAT4,r1,c1)
```

```
else:
```

```
print("\n TRANSPOSE OF SQUARE MATRIX IS : ")
```

```
transpose_mat(MAT,MAT4,r1,c1)
```

```
display_mat(MAT4,r1,c1)
```

```
else:
```

```
print("Transpose of Second matrix is: ")
```

```
if(r2!=c2) :
```

```
print("\n TRANSPOSE OF RECTANGULAR  
MATRIX IS : ")
```

```
MAT5= [[0 for x in range(r2)] for y in range(c2)]
```

```
transposerec_mat(MAT1,MAT5,r2,c2)
```

```
displaytrans_mat(MAT5,r2,c2)
```

```
else:
```

```

    print("\n  TRANSPOSE OF SQUARE MATRIX IS : ")
    transpose_mat(MAT1,MAT5,r2,c2)
    display_mat(MAT5,r2,c2)

elif(ch==4) :
    if(c1==r2):
        multiplication_mat(MAT,MAT1,MAT6,r1,c1,c2)
        print("Multiplication OF MATRIX IS : ")
        display_mat(MAT6,r1,c2)
    else:
        print("Multiplication OF MATRIX CANNOT BE
PERFORMED")

    else:
        print("loop ended")
        break;
else:
    print("Exit")
    break;

main()

```

Output :

Enter 1 to start new and 2 to exit: 1

New loop starts

First Matrix:

Enter the value of the row: 3

Enter the value of the column: 3

Matrix Elements are

**1
2
3
4
5
6
7
8
8**

Matrix is:

**1 2 3

4 5 6

7 8 8**

Second Matrix:

Enter the value of the row: 3

Enter the value of the column: 3

Matrix Elements are

**10
11
12
13
14
15**

16
17
18

Matrix is:

10	11	12
13	14	15
16	17	18

- 1 : Enter 1 Addition of Matrix:**
- 2 : Enter 2 Subtraction of Matrix :**
- 3 : Enter 3 Transpose of Matrix:**
- 4 : Enter 4 Multiplication of Matrix:**
- 5 : Exit**

Enter your choice : 1

ADDITION OF MATRIX IS :

Matrix is:

11	13	15
17	19	21
23	25	26

- 1 : Enter 1 Addition of Matrix:**
- 2 : Enter 2 Subtraction of Matrix :**
- 3 : Enter 3 Transpose of Matrix:**
- 4 : Enter 4 Multiplication of Matrix:**
- 5 : Exit**

Enter your choice : 2

Subtraction OF MATRIX IS :

Matrix is:

-9	-9	-9
-9	-9	-9
-9	-9	-10

1 : Enter 1 Addition of Matrix:

2 : Enter 2 Subtraction of Matrix :

3 : Enter 3 Transpose of Matrix:

4 : Enter 4 Multiplication of Matrix:

5 : Exit

Enter your choice : 3

**Enter 1 for transpose of First Matrix and 2 for Second:
4**

Transpose of Second matrix is:

TRANSPOSE OF SQUARE MATRIX IS :

Matrix is:

10	13	16
11	14	17
12	15	18

1 : Enter 1 Addition of Matrix:

2 : Enter 2 Subtraction of Matrix :

3 : Enter 3 Transpose of Matrix:

4 : Enter 4 Multiplication of Matrix:

5 : Exit

Enter your choice :