**INPUT CODE:**

def accept\_matrix(M):

print("\nEnter the order of the Matrix (row,col): ")

r = int(input("\trow = "))

c = int(input("\tcol = "))

print("Enter the elements of the Matrix: \n")

for i in range(r):

A = []

for j in range(c):

A.append(int(input()))

M.append(A)

print("\nMatrix accepted successfully\n")

return r, c

def display\_matrix(M, r, c):

print("Matrix (%d,%d): " % (r, c))

for i in range(r):

print("\t\t", end=' ')

for j in range(c):

print("%3d" % M[i][j], end=' ')

print("")

def addition\_matrix(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\_matrix(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 multiplication\_matrix(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 find\_transpose\_matrix(M, r, c, T):

for i in range(c):

A = []

for j in range(r):

A.append(M[j][i])

T.append(A)

def main():

while True:

print("\t\t\t1: Accept Matrix")

print("\t\t\t2: Display Matrix")

print("\t\t\t3: Addition of Matrices")

print("\t\t\t4: Subtraction of Matrices")

print("\t\t\t5: Multiplication of Matrices")

print("\t\t\t6: Transpose Matrix")

print("\t\t\t7: Exit")

ch = int(input("Enter your choice: "))

M3 = []

if ch == 7:

print("End of Program")

break

elif ch == 1:

M1 = []

M2 = []

print("Input First Matrix")

r1, c1 = accept\_matrix(M1)

print("Input Second Matrix")

r2, c2 = accept\_matrix(M2)

elif ch == 2:

print("\tFirst ", end=' ')

display\_matrix(M1, r1, c1)

print("\tSecond ", end=' ')

display\_matrix(M2, r2, c2)

elif ch == 3:

print("\tFirst ", end=' ')

display\_matrix(M1, r1, c1)

print("\tSecond ", end=' ')

display\_matrix(M2, r2, c2)

if r1 == r2 and c1 == c2:

addition\_matrix(M1, M2, M3, r1, c1)

print("\tAddition ")

display\_matrix(M3, r1, c1)

else:

print("Addition not possible (order not same)")

elif ch == 4:

print("\tFirst ", end=' ')

display\_matrix(M1, r1, c1)

print("\tSecond ", end=' ')

display\_matrix(M2, r2, c2)

if r1 == r2 and c1 == c2:

subtraction\_matrix(M1, M2, M3, r1, c1)

print("\tSubtraction ")

display\_matrix(M3, r1, c1)

else:

print("Subtraction not possible (order not same)")

elif ch == 5:

print("\tFirst ", end=' ')

display\_matrix(M1, r1, c1)

print("\tSecond ", end=' ')

display\_matrix(M2, r2, c2)

if c1 == r2:

multiplication\_matrix(M1, M2, M3, r1, c1, c2)

print("\tMultiplication ")

display\_matrix(M3, r1, c2)

else:

print("Multiplication not possible")

elif ch == 6:

print("\tFirst ", end=' ')

display\_matrix(M1, r1, c1)

find\_transpose\_matrix(M1, r1, c1, M3)

print("\tTranspose ", end=' ')

display\_matrix(M3, c1, r1)

M3 = []

print("\tSecond ", end=' ')

display\_matrix(M2, r2, c2)

find\_transpose\_matrix(M2, r2, c2, M3)

print("\tTranspose ", end=' ')

display\_matrix(M3, c2, r2)

else:

print("Wrong choice entered! Try again")

main()

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OUTPUT:

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1: Accept Matrix

2: Display Matrix

3: Addition of Matrices

4: Substraction of Matrices

5: Multiplication of Matrices

6: Transpose Matrix

7: Exit

Enter your choice: 1

Input First Matrix

Enter the order of the Matrix (row, col):

row = 2

col = 2

Enter the elements of the Matrix:

1

2

3

4

Matrix accepted successfully

Input Second Matrix

Enter the order of the Matrix (row, col):

row = 2

col = 2

Enter the elements of the Matrix:

5

6

7

8

Matrix accepted successfully

1: Accept Matrix

2: Display Matrix

3: Addition of Matrices

4: Substraction of Matrices

5: Multiplication of Matrices

6: Transpose Matrix

7: Exit

Enter your choice: 2

First Matrix

Matrix (2, 2):

1 2

3 4

Second Matrix

Matrix (2, 2):

5 6

7 8

1: Accept Matrix

2: Display Matrix

3: Addition of Matrices

4: Substraction of Matrices

5: Multiplication of Matrices

6: Transpose Matrix

7: Exit

Enter your choice: 3

First Matrix

Matrix (2, 2):

1 2

3 4

Second Matrix

Matrix (2, 2):

5 6

7 8

Addition Matrix

Matrix (2, 2):

6 8

10 12

1: Accept Matrix

2: Display Matrix

3: Addition of Matrices

4: Substraction of Matrices

5: Multiplication of Matrices

6: Transpose Matrix

7: Exit

Enter your choice: 4

First Matrix

Matrix (2, 2):

1 2

3 4

Second Matrix

Matrix (2, 2):

5 6

7 8

Substraction Matrix

Matrix (2, 2):

-4 -4

-4 -4

1: Accept Matrix

2: Display Matrix

3: Addition of Matrices

4: Substraction of Matrices

5: Multiplication of Matrices

6: Transpose Matrix

7: Exit

Enter your choice: 5

First Matrix

Matrix (2, 2):

1 2

3 4

Second Matrix

Matrix (2, 2):

5 6

7 8

Multiplication Matrix

Matrix (2, 2):

19 22

43 50

1: Accept Matrix

2: Display Matrix

3: Addition of Matrices

4: Substraction of Matrices

5: Multiplication of Matrices

6: Transpose Matrix

7: Exit

Enter your choice: 6

First Matrix

Matrix (2, 2):

1 2

3 4

Transpose Matrix

Matrix (2, 2):

1 3

2 4

Second Matrix

Matrix (2, 2):

5 6

7 8

Transpose Matrix

Matrix (2, 2):

5 7

6 8

1: Accept Matrix

2: Display Matrix

3: Addition of Matrices

4: Substraction of Matrices

5: Multiplication of Matrices

6: Transpose Matrix

7: Exit

Enter your choice: 7

End of Program

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