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| **Ex. No. 11**  **Date:30.06.2021** | **LIST AND TUPLES – LEVEL 3** |

**AIM:**

To write python program using List and Tuple.

**PROGRAMS:**

**a) Matrix Multiplication**

**Description:**

Given two matrix the task is to multiply two matrices.

Example:

Input : X = [[1, 7, 3],

             [3, 5, 6],

             [6, 8, 9]]

       Y = [[1, 1, 1, 2],

           [6, 7, 3, 0],

           [4, 5, 9, 1]]

Output : [55, 65, 49, 5]

         [57, 68, 72, 12]

         [90, 107, 111, 21]

Constraints:

1.  Size of the matrix cannot be negative

2.  Size of the matrix cannot be zero

3.  The column size of the first matrix should be same as row size of the second matrix

Input Format:

Get the row and column size for the two matrices. The first 2 values are the row and column size of first matrix and next 2 values are the row and column size of second matrix.

Get two matrices in 2D list (Refer the example for input format).

Output Format:

Display the values row by row in list format.

Sample Input:

-9

Sample Output:

Size of the matrix cannot be negative.

Sample Input:

2

-9

Sample Output:

Size of the matrix cannot be negative.

Sample Input:

0

Sample Output:

Size of the matrix cannot be zero.

Sample Input:

2

2

3

3

Sample Output:

Matrix multiplication is not possible.

Sample Input:

2

2

2

2

2

1

1

2

2

2

1

1

Sample Output:

[5, 5]

[4, 4]

**Program:**

‘’’Name: R.Sridevi

Roll.no: 20UIT021

Program name: Matrix multiplication.’’’

def matrix():

global r1,r2,c1,c2

r1=int(input())

if(r1>=0):

if(r1!=0):

c1=int(input())

if(c1>=0):

if(c1!=0):

r2=int(input())

if(r2>=0):

if(r2!=0):

c2=int(input())

if(c2>=0):

if(c2!=0):

if(c1==r2):

return True

else:

print('Matrix multiplication is not possible.')

else:

print('Size of the matrix cannot be zero.')

else:

print('Size of the matrix cannot be negative.')

else:

print('Size of the matrix cannot be zero.')

else:

print('Size of the matrix cannot be negative.')

else:

print('Size of the matrix cannot be zero.')

else:

print('Size of the matrix cannot be negative.')

else:

print('Size of the matrix cannot be zero.')

else:

print('Size of the matrix cannot be negative.')

matrix1= []

matrix2 = []

result = []

if matrix()==True:

for i in range(r1):

list1 = []

for i in range(c1):

list1.append(int(input()))

matrix1.append(list1)

for i in range(r2):

list2 = []

for i in range(c2):

list2.append(int(input()))

matrix2.append(list2)

for i in range(r2):

list3 = []

for i in range(c2):

list3.append(0)

result.append(list3)

for i in range(len(matrix1)):

for j in range(len(matrix2[0])):

for k in range(len(matrix2)):

result[i][j] += matrix1[i][k]\*matrix2[k][j]

for i in result:

print(i)

**Test Cases:**

|  |  |  |
| --- | --- | --- |
| **Test Case No.** | **Input** | **Expected Output** |
| 1 | -3 | Size of the matrix cannot be negative. |
| 2 | 3  -2 | Size of the matrix cannot be negative. |
| 3 | 3  3  -2 | Size of the matrix cannot be negative. |
| 4 | 2  2  2  -2 | Size of the matrix cannot be negative. |
| 5 | 0 | Size of the matrix cannot be zero. |
| 6 | 2  0 | Size of the matrix cannot be zero. |
| 7 | 2  2  0 | Size of the matrix cannot be zero. |
| 8 | 2  2  2  0 | Size of the matrix cannot be zero. |
| 9 | 2  2  3  3 | Matrix multiplication is not possible. |
| **Total Test Cases** | | **9** |
| **Number of Test Cases Passed** | | **9** |

**b) Create a list of tuples from given list having number and its cube in each tuple**

**Description:**

Given a list of numbers of list, write a Python program to create a list of tuples having first element as the number and second element as the cube of the number.

Use user defined function.

Example:

Input: [2, 4, 6]

Output: [(2, 8), (4, 64), (6, 216)]

Input Format:

Get the input as a string separated with space and then convert it to integer list.

Output Format:

Display the list with the input number and cubic value put into tuple.

Constraints:

1.    List should not have 0 and negative values

Sample Input:

1 0 3 4 5

Sample Output:

Sorry… Operation can be done.

Sample Input:

9 2 3 -7 -5

Sample Output:

Sorry… Operation can be done.

Sample Input:

1 2 3

Sample Output:

[(1, 1), (2, 8), (3, 27)]

**Program:**

''' Name :R.sridevi

Roll Number : 20uit021

Program Name : Create a list of tuples from given list having number and its cube in each tuple

'''

num = input()

num = num.split(' ')

for i in range(len(num)):

num[i] = int(num[i])

if 0 not in num:

for i in num:

if i<0:

print('Sorry… Operation can be done.')

break

else:

result = []

for i in num:

list1 = [i,pow(i,3)]

result.append(tuple(list1))

print(result)

else:

print('Sorry… Operation can be done.')

**Test Cases:**

|  |  |  |
| --- | --- | --- |
| **Test Case No.** | **Input** | **Expected Output** |
| 1 | 1 0 3 4 5 | Sorry… Operation can be done. |
| 2 | 0 | Sorry… Operation can be done. |
| 3 | 0 0 | Sorry… Operation can be done. |
| 4 | 9 2 3 -7 -5 | Sorry… Operation can be done. |
| 5 | -2 | Sorry… Operation can be done. |
| 6 | -7 -3 | Sorry… Operation can be done. |
| 7 | -7 9 8 0 | Sorry… Operation can be done. |
| 8 | 1 2 3 | [(1, 1), (2, 8), (3, 27)] |
| **Total Test Cases** | | **8** |
| **Number of Test Cases Passed** | |  |

**RESULT:**

Thus, the Python programs are executed successfully.