S.No: 15	Exp. Name: ***Write a python program to perform Matrix Multiplication.***	Date:2024-04-08

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Aim:

Write a python program to perform Matrix Multiplication.

Source Code:

matrixmul.py

```
A=[]
print("Enter values for matrix - A")
m=int(input("Number of rows, m = "))
n=int(input("Number of columns, n = "))
for i in range(m):
   a=[]
   for j in range(n):
      print("Entry in row: {} column: {}".format(i+1,j+1))
      a.append(int(input()))
   A.append(a)
B=[]
print("Enter values for matrix - B")
p=int(input("Number of rows, m = "))
q=int(input("Number of columns, n = "))
for i in range(p):
   b=[]
   for j in range(q):
      print("Entry in row: {} column: {}".format(i+1,j+1))
      b.append(int(input()))
   B.append(b)
print("Matrix - A =",A)
print("Matrix - B =",B)
if(n==p):
   mul=[]
   for j in range(len(A)):
      m1=[]
      for j in range(len(B[0])):
         m1.append(0)
      mul.append(m1)
   for i in range(len(A)):
      m1=[]
      for j in range(len(B[0])):
         for k in range(len(B)):
            mul[i][j]+=A[i][k]*B[k][j]
   print("Matrix - A * Matrix- B =",mul)
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter values for matrix - A 3
Number of rows, m = 3
Number of columns, n = 3
Entry in row: 1 column: 1 12

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Entry in row: 1 column: 2 7
Entry in row: 1 column: 3 3
Entry in row: 2 column: 1 4
Entry in row: 2 column: 2 5
Entry in row: 2 column: 3 6
Entry in row: 3 column: 1 7
Entry in row: 3 column: 2 8
Entry in row: 3 column: 3 9
Enter values for matrix - B 3
Number of rows, m =  3
Number of columns, n =  4
Entry in row: 1 column: 1 5
Entry in row: 1 column: 2 8
Entry in row: 1 column: 3 1
Entry in row: 1 column: 4 2
Entry in row: 2 column: 1 6
Entry in row: 2 column: 2 7
Entry in row: 2 column: 3 3
Entry in row: 2 column: 4 0
Entry in row: 3 column: 1 4
Entry in row: 3 column: 2 5
Entry in row: 3 column: 3 9
Entry in row: 3 column: 4 1
Matrix - A = [[12, 7, 3], [4, 5, 6], [7, 8, 9]]
Matrix - B = [[5, 8, 1, 2], [6, 7, 3, 0], [4, 5, 9, 1]]
Matrix - A * Matrix- B = [[114, 160, 60, 27], [74, 97, 73, 14], [119, 157, 112, 23]]
```