

1. Element Wise Multiplication / Hadamard product

Write a code that takes two 2-D Matrices with exact same dimension size and perform element wise multiplication.

Input:

First line of the input has two integers R, C denoting row-size(R) and column-size(C) of the matrices. Next R lines each having C elements are the contents of the first matrix.

Next R lines similarly are the contents of the second matrix.

Output:

Resultant matrix after element-wise multiplication of the first and second matrix. Output will be printed upto two decimal places.

Sample Input	Sample Output
3 4 2 3 4 5 6 7 8 9 1 3 5 7.2 2 0 2 2 0 1 0 1 1 0 1 0	4.00 0.00 8.00 10.00 0.00 7.00 0.00 9.00 1.00 0.00 5.00 0.00

2. Convolutional Filter

Write a code that takes two decimal matrices (M, F). M has dimension size $R \times C$ and F is a square matrix with dimension size $N \times N$ where $N < R, C$.

Your code has to perform

- element wise matrix multiplication on the first $N \times N$ elements of M and entire F. Resultant values will be summed and saved at location 0,0 of another matrix.

2	0	1	1
0	1	0	0
0	0	1	0
0	3	0	0

 \times

1	0	1
0	0	0
0	1	0

 $=$

3	

Mathematically, it's $(2 * 1) + (0 * 0) + (1 * 1) + (0 * 0) + (1 * 0) + (0 * 0) + (0 * 0) + (0 * 1) + (1 * 0) = 3$

- Repeatedly this operation will be performed moving the operation region of M matrix one column right till the end of the column is reached.

2	0	1	1
0	1	0	0
0	0	1	0
0	3	0	0

1	0	1
0	0	0
0	1	0

3	2

- Repeatedly this operation will be performed moving the operation region of M matrix one row right till the end of the row is reached for each column.

2	0	1	1
0	1	0	0
0	0	1	0
0	3	0	0

1	0	1
0	0	0
0	1	0

3	2
3	

2	0	1	1
0	1	0	0
0	0	1	0
0	3	0	0

1	0	1
0	0	0
0	1	0

3	2
3	1

Input: R, C followed by matrix R*C elements of M. Then N followed by N*N elements of F.

Output: Resultant matrix after the above described operation. Output will be printed upto two decimal places.

Sample Input	Sample Output
4 5 2 0 1 1 0 0 1 0 0 3 0 0 1 0 0 2 0 3 2 1 2 0 1 1 0	0.00 2.00 1.00 0.00 1.00 0.00 1.00 3.00 2.00 1.00 3.00 2.00