Problem C

Matrix

Based on the mathematical concepts, matrix is a two-dimension array of numbers (or variables representing numbers). An *n* x *m* matrix has *n* rows and *m* columns of elements.

A multiplication of two matrices, ***A*** and ***B***, produces the matrix ***C***, whose elements, $c_{i,j}$, can be computed as follows:

$$c_{i,j} = \sum_{k=0}^{p-1} a_{i,k} b_{k,j}$$

where ***A*** is an *m* x *p* matrix and ***B*** is a *p* x *n* matrix ($0 \leq i < n$, $0 \leq j < m$). This multiplication is illustrated in Figure C.1.

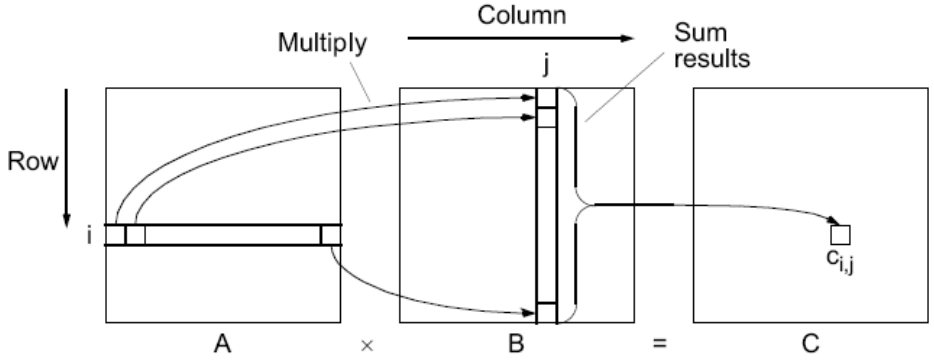

Figure C.1. – Matrix multiplication, ***C*** = ***A*** x ***B***.

Write a parallel program that computes the multiplication of two matrices.

Input

The input contains only one test case. The first line contains two integers: the numbers of rows (*M*) and the number of columns (*P*) of a matrix ***A*** separated by a blank space ($0 \leq M, P < 5000$). The next *M* lines contain *P* integers in each line separated by a blank space representing the $a_{m,p}$ element of the matrix ***A*** ($0 \leq m < M$, $0 \leq p < P$). The next line contains two integers: the numbers of rows (*P*) and the numbers of columns (*N*) of a matrix ***B*** separated by a blank space ($0 \leq N < 5000$). Notice that the same value *P* is guarantee in the input. The next *P* lines contain *N* integers in each line representing the $b_{p,n}$ element of the matrix ***B*** ($0 \leq n < N$).

The input must be read from a file named matrix.in

Output

The output must contain M lines. Each line contains N elements separated by a single blank space representing the $c_{n,m}$ element of the matrix $\boldsymbol{C}$ ($0 \leq n < N$, $0 \leq m < M$).

The output must be written to a file named matrix.out

Example

Input	Output for the input
4 3 2 3 0 0 2 -1 1 0 2 3 1 4 3 3 2 2 -1 7 1 -4 8 1 3	25 7 -14 6 1 -11 18 4 5 45 11 5