Problem I: Milling machines

A fab lab is an open, small-scale workshop where you can create or fabricate almost anything you want mostly by using computer controlled tools like a laser cutter or a 3D printer. The FAU fab lab recently got a CNC milling machine. Using the milling machine you can cut or remove material with different tools from the surface of a workpiece. It is controlled via a computer program.

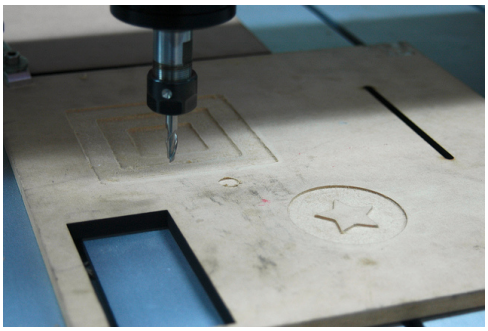


Photo by aurelie ghalim on Flickr

I sometimes wondered what happens if multiple different shaped workpieces are sent through the same milling program. For simplification assume that we have only two dimensional workpieces without holes. A milling program consists of multiple steps; each step describes where the milling machine has to remove material (using different tools) from the top of the surface.

Input

The first line consists of two integers W and S, where W gives the number of workpieces and S the number of steps in the milling program ($1 \leq W, S \leq 10^4$). The next line consists of two integers X and Y, where X gives the width and Y gives the maximal possible height of workpieces ($1 \leq X, Y \leq 100$).

Then follow W lines, each describing one workpiece. Each workpiece description consists of X non-negative integers specifying the surface height in that column.

Then follow S lines, each describing one milling step of the milling progam. Each milling step description consists of X non-negative integers s_i ($0 \leq s_i \leq Y$) specifying the amount of surface to cut off in each column (relative to the height of the milling area, i.e. Y, not relative to the top of the workpiece). See Fig. I.1 for details.

Output

For each workpiece, output one line containing X integers specifying the remaining surface heights (in the same order as in the input).

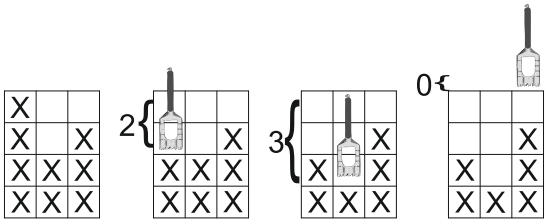


Figure I.1: Second workpiece in first sample: initial workpiece followed by milling in each column – the value in the milling program determines the vertical position of the cutter head.

Sample Input 1

```
2 1
3 4
4 4 4
4 2 3
2 3 0
```

Sample Output 1

```
2 1 4
2 1 3
```

Sample Input 2

```
1 3
10 100
11 22 33 44 55 66 77 88 99 100
1 100 1 100 1 100 1 100 1 100
58 58 58 58 58 58 58 58 58 58
42 42 42 42 42 42 42 42 66 42
```

Sample Output 2

```
11 0 33 0 42 0 42 0 34 0
```