Given n cities $c_1, c_2, \ldots, c_n$ on a map, for every $i \neq j$ there exists a road connecting c_i and c_j. Each road is **one-way** and has a **positive** length. Though there is no road connecting a city to itself, we pretend that there is a road of length 0 from c_i to c_i for each $i \in [1, n]$.

Let M be an n by n matrix in which each entry $M(i, j)$ denotes the length of the road from c_i to c_j. Note that $M(i, i) = 0$ for each $i \in [1, n]$. Let S be the **shortcut map** of M. That is, S is another n by n matrix in which each entry $S(i, j)$ denotes the length of the shortest path that connects c_i and c_j, where the shortest path from c_i to c_j is a sequence of roads $(c_i, c_x), (c_x, c_y), \ldots, (c_z, c_j)$ whose total length

$$M(c_i, c_x) + M(c_x, c_y) + \cdots + M(c_z, c_j)$$

is the minimum among all the paths that connect c_i and c_j.

We store the above two matrices in a disk, but unfortunately we found that the disk has some bad sectors so that some entries in M cannot be read. We are turnning to your help to recover the unreadable entries. The information on our hands are the correct S, a problematic M where the entries that have value -1 are those unreadable entries, and the sum W of all entries in the correct M.

Hint. A subpath of a shortest path is a shortest path.

Input

The input has $2n + 1$ lines. The first line contains n ($n \leq 100$) and W. The next n lines comprise the problematic M, and the last n lines comprise the correct S. In M, each entry $M(i, j)$ is an integer in the range $[-1, 100]$ and at most 20 entries have value -1.

Output

Output a recovered n by n matrix M' in n lines, where the i-th line is the i-th row in M', so that the sum of all entries in M' equals W, and S is the shortcut map of M' also. If there are multiple choices for M', outputting any of them suffices.

Sample Input

```
3 19
0 1 3
2 0 -1
-1 2 0
0 1 3
2 0 5
4 2 0
```

Sample Output

```
0 1 3
2 0 6
5 2 0
```