

E: Buttons

- Time Limit: 2 sec

There is an $H \times W$ grid, with one button in each cell. Initially, all buttons are off. You will push them and turn them on.

Your task is to find a "good" timing of pressing the buttons. Let t_{ij} be the timing to push the button of row i and column j . The timing is said to be "good" if and only if the following conditions are satisfied.

- t_{ij} is an integer between 0 and 10^9 for all i and j .
- $t_{kl} + a_{ij} \leq t_{ij} \leq t_{kl} + b_{ij}$ for every cell kl which is a horizontal or vertical neighbor of the cell ij , i.e., $|i - k| + |j - l| = 1$.

Write a program to output a "good" timing for the given a and b . If there are several possible timings, you can output any of them. If there is no "good" timing, you should output -1 .

Input

The input consists of a single test case of the following format.

```

H W
a11 ... a1W
⋮
aH1 ... aHW
b11 ... b1W
⋮
bH1 ... bHW

```

H and W represent the height and width of the given grid ($2 \leq H, W \leq 50$). a_{ij} and b_{ij} represent the range of time differences for the button of row i and column j ($-100,000 \leq a_{ij} \leq b_{ij} \leq 100,000$).

Output

If there is a "good" timing, output it in the following format.

```

T11 ... T1W
⋮
TH1 ... THW

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T_{ij} is an integer representing the timing to push the button of row i and column j . The timings should satisfy the conditions defined in the problem statement. If there are multiple correct answers, you can print any of them.

If there is no "good" timing, you should output -1 instead.

Examples

Input	Output
<pre> 3 3 -2 1 -2 1 -2 1 -2 1 -2 -1 2 -1 2 -1 2 -1 2 -1 </pre>	<pre> 0 1 0 1 0 2 0 2 0 </pre>
<pre> 2 2 1 1 1 1 1 1 1 1 </pre>	<pre> -1 </pre>