Singularity Cup P5 - Perfect Matrix

Time limit: 2.0s   **Memory limit:** 256M

Kevin wants a "perfect matrix" with N rows and M columns.

He has certain expectations for some matrix K that he considers perfect.

He has a desired integer range for each element of K, as well as a desired integer range for each row sum and column sum.

More formally, given 2 other $N \times M$ matrices L and R, and matrices A and B of dimensions $N \times 2$ and $M \times 2$ respectively, all of the following conditions must hold:

- $L_{ij} \leq K_{ij} \leq R_{ij}$ for all $(1 \leq i \leq N, 1 \leq j \leq M)$
- $A_{i1} \leq \sum_{j=1}^{M} K_{ij} \leq A_{i2}$ for all $(1 \leq i \leq N)$
- $B_{j1} \leq \sum_{i=1}^{N} K_{ij} \leq B_{j2}$ for all $(1 \leq j \leq M)$

Help Kevin find any perfect matrix or determine that it is impossible to do so.

Constraints

$1 \leq N, M \leq 1000$

$0 \leq L_{ij} \leq R_{ij} \leq 10^6$

$0 \leq A_{i1} \leq A_{i2} \leq 10^9$

$0 \leq B_{j1} \leq B_{j2} \leq 10^9$

Input Specification

The first line of input contains integers N and M.

The next N lines of input each contain M space-separated integers representing the matrix L, the minimum values of each element.

The next N lines of input each contain M space-separated integers representing the matrix R, the maximum values of each element.

The next N lines of input each contain 2 space-separated integers representing the matrix A, the minimum and maximum sums of each row.

The next M lines of input each contain 2 space-separated integers representing the matrix B, the minimum and maximum sums of each column.

Output Specification

Output N lines of M space-separated integers representing any perfect matrix that satisfies Kevin or report that it is impossible to do so by outputting `-1`.

Sample Input

```
2 2
3 0
0 3
3 9
9 3
5 5
1 6
6 9
0 9
```

Sample Output

```
3 2
3 3
```

Explanation for Sample

In the example above, this is the only matrix that Kevin will consider perfect.