B. Cheapest Way To Travel

time limit per test: 1 second
memory limit per test: 256 megabytes

You are given a $N \times M$ map(grid). An agent wants to travel from the start (top left) of the map to the finish line(bottom right).

Each cell on the map, contains a non-negative number, denoting the cost of passing that cell.

Your agent can only move one step at each time only to one of these direction — Right or down. For moving to a direction, a cell on that direction must be available on the map.

Return a path for the agent to travel from start to end which cost the agent the least cost.

Input

The first line contains two numbers N, M $(1 =< N, M <= 10^3)$ — the number of the rows and columns in the grid, respectively.

The following N lines, each will contain M numbers c_i $(0 <= c_i <= 10^6)$ where represents the cost of passing that specific cell on the grid.

Output

In the first line of the input, print the minimum total amount of the cost for agent to reach the finish.

In the following line, print the cost of each cell, which agent passed on its way to the finish.

Example

input Скопировать

```
4 4
1 3 1 2
1 5 1 1
4 2 1 3
2 1 2 1
```

output Скопировать

```
10
1 3 1 1 1 2 1
```

Note

Here is the visualization of the example test: