Not a Real World Problem - Statement

Consider a grid with H rows and W columns where h_{ij} is the value of the cell located at row i and column j. N particles are distributed over the grid, at most one particle per cell. The particles have values asociated, being p_i the value of the i-th particle and (y_i, x_i) the cell where it is located at.
If we call P to the set of all particles and E to the set of pairs of particles located at adjacent cells, we define the value of the whole grid as:

$$V = \sum_{i \in P} p_i \, h_{y_i x_i} \; + \sum_{(i,j) \in E} p_i \, p_j$$

Two cells are considered adjacent if they share a side.
You are given H, W, N, h's values and the absolute values of p's. Your task is to choose the sign of each p_i in order to maximize V.

Input:

First line will contain T, the number of testcases. Then T testcases follow each one containing:

- a first line with 3 space-separated integer values: H, W and N.
- H lines, each one with W space-separated integers. The j-th integer of the i-th line of these H lines represents $h_{i,j}$, that is, the value of the cell with row i and column j.
- N lines of 3 space-separated integers: the i-th of these lines contains the data of the i-th particle in this particular order: y_i, x_i and $|p_i|$.

Output:

For each testcase, output 2 lines:

- a first line with a the maximum value of V
- a second line with N space-separated numbers: the i-th number should be 1 if you choose a positive sign to the i-th particle's value or -1 otherwise. If there are multiple solutions you can print anyone of them.

Constraints:

- $1 \le T \le 10$
- $1 \le H, W \le 1000$
- $1 \le N \le 200$
- $|h_{ij}| \le 1000$
- $1 \le y_i \le H$
- $1 \le x_i \le W$
- $|p_i| \le 100$
- No two particles are located at the same cell

Subtasks:

- 10 points : $1 \leq N \leq 10$
- 20 points : $1 \leq H \leq 2$
- 70 points : original constraints

Sample Input:

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

Sample Output:

```
12
1 1 -1
```