Problem: NET
Network

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The rich and powerful of Limogrod, the capital of Limonia, want to create an „inter-network". They have decided to connect all the houses, so everyone can share files with everyone else. They have also decided that there will be only one cable and it should form a cycle (it should start and end in the same place).

Limogrod is divided into square cells, with sides being meridians and parallels, which helps a lot in planning. The map of the every district was prepared with houses to connect and prices to put a cable through certain cells. Unfortunately, it is impossible to put a cable in some cells (national parks, ponds and such).

Moreover, the cost raises every time we want to put the cable through a certain cell. For instance, if the nominal cost of a certain cell is c, then putting the first cable costs us c, the second one costs $2c$, and generally, if we want to put the cable there k times, we have to pay $c + 2c + \ldots + kc$ total.

Can you help people of Limogrod and find the cheapest plan to connect all the houses?

Input

In the first line of the input file there are two integers n, m – the size of the map of Limogrod ($1 \leq n, m \leq 500$).

The next n lines contain the description of the city. Each line contains m integers and the j-th number in the i-th line of the description explains the (i, j) cell. If this number

- equals to zero, this means that on the cell (i, j) there is a house,
- equals to -1, this means that we cannot put a cable through this cell,
- equals $1 \leq c \leq 10^6$, this means that we can put a cable through this cell and the nominal cost of this cell is exactly c.

Output

In the first line of output file, you have to print a single integer t – the length of the cable. In the next t lines you need to print the cells, through which the cable should be put. Remember that the cells are numbered from 1 and point $(1, 1)$ is in the upper-left corner. Each two consecutive cells should share a side. You don't have to print the first cell on the end of the output (but the last cell should be the neighbor of the first one).

Scoring

In case of the proper plan of „inter-network" the score is the sum of costs of every cable. We remind you that if you want to put a cable segment in the cell of nominal cost c k times, you will pay $(\sum_{i=1}^{k} i) \cdot c$ total. This is a minimization problem, therefore the smaller the score, the better.

The percentage of guaranteed points is 40%.

Example

For input data:

```
5 5
9 9 2 2 2
1 1 2 3 3
0 -1 2 3 3
1 -1 1 0 0
3 3 3 3 3
```

the correct result is for instance:

```
14
2 1
2 2
2 3
3 3
4 3
4 4
4 5
4 4
4 3
5 3
5 2
5 1
4 1
3 1
```

Explanation: Such solution scores 19 points.