Problem E. Water bucket

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

After a long drought, it begins raining in a 2-dimensional world.

There are N raindrops positioned at integer coordinates (x_i, y_i). At the end of each second, each raindrop falls down one unit. For example, a raindrop at position (x_i, y_i) falls to $(x_i, y_i - 1)$. Once a raindrop hits the ground, it disappears.

The villagers have constructed a large water bucket of length L. The water bucket is placed just above the ground on $y = 1$ at a position of your choosing. If the left endpoint of the water bucket is $(l_i, 1)$, then the right endpoint is $(l_i + L - 1, 1)$. If any raindrops fall into the water bucket, that is, if there is a raindrop (x_i, y_i) such that $l_i \leq x_i < l_i + L$ and $y_i = 1$, then the water bucket collects the raindrop.

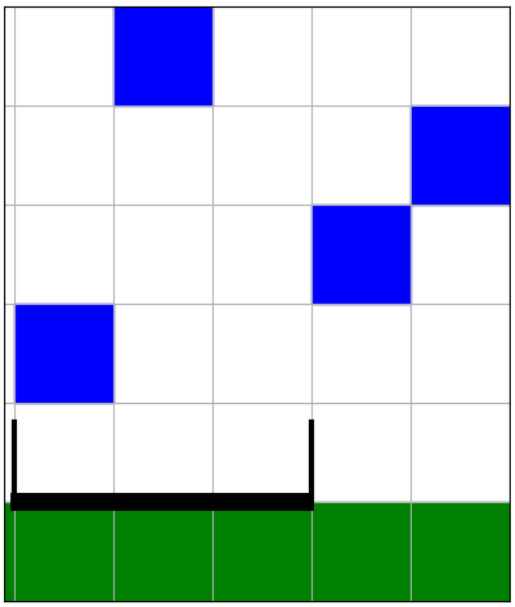

Diagram for Example 1.

The villagers would like to collect as much rain as possible. They have put a computer chip and wheels on the water bucket, which enables it to move 1 unit left or right at the beginning of each second (or stay stationary). The villagers have asked you to program the computer chip so the water bucket collects as much water as possible.

Given the positions of the water droplets, determine the optimal starting position and path of the water bucket so as to collect as many raindrops as possible.

Input

The first line of input contains two space-separated integers N $(1 \leq N \leq 10^3)$ and L $(1 \leq L \leq 10^3)$.

The next N lines contain two space-separated integers, the starting position of the water droplets x_i, y_i: $(0 \leq x_i < 10^3)$, $(2 \leq y_i < 10^3)$. It is guaranteed that the position of the water droplets is unique.

Output

The first line should consist of a single integer, the maximum number of raindrops which can be collected.

The second line of output must consist of a single integer T ($1 \leq T \leq 10^3$). If the second line of output is empty, you will only receive 50% for the subtask (see Scoring).

Of the next T lines, the jth line must be the position of the left l_j ($0 \leq l_j < 10^3$) endpoint of the bucket at second j.

Scoring

You will receive 50% of the score of every subtask if you correctly output the maximum number of raindrops which can be collected. To achieve 100% of the score of every subtask, you must also output the optimal path of the bucket.

Subtask 1: (0 points) Examples.

Subtask 2: (30 points) $x_i, y_i < 5$.

Subtask 3: (70 points) No further restrictions.

Examples

standard input	standard output
4 3 0 2 3 3 4 4 1 5	4 4 0 1 2 1
5 3 1 2 4 2 3 2 6 3 7 4	4 3 3 4 5

Note

Explanation of Example 1:

The water bucket moves first, then the raindrops fall. Explicitly, the simulation works as follows:

1. The water bucket is placed.
2. The raindrops fall.
3. The water bucket moves.
4. Repeat from step 2.