F. Puzzle

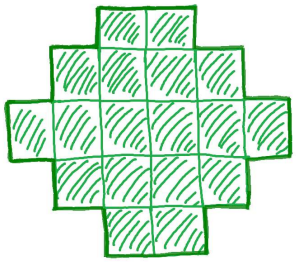
time limit per test: 2 seconds
memory limit per test: 512 megabytes

You have been gifted a puzzle, where each piece of this puzzle is a square with a side length of one. You can glue any picture onto this puzzle, cut it, and obtain an almost ordinary jigsaw puzzle.

Your friend is an avid mathematician, so he suggested you consider the following problem. Is it possible to arrange the puzzle pieces in such a way that the following conditions are met:

- the pieces are aligned parallel to the coordinate axes;
- the pieces do not overlap each other;
- all pieces form a single connected component (i.e., there exists a path from each piece to every other piece along the pieces, where each two consecutive pieces share a side);
- the ratio of the perimeter of this component to the area of this component equals $\frac{p}{s}$;
- the number of pieces used does not exceed $50\,000$.

Can you handle it?



For this figure, the ratio of the perimeter to the area is $\frac{11}{9}$

Input

Each test consists of several test cases. The first line contains a single integer t ($1 \le t \le 10$) — the number of test cases. The description of the test cases follows.

The only line of each test case contains two integers p and s ($1 \le p, s \le 50$).

Output

For each test case:

- if it is impossible to arrange the pieces as described above, output a single integer -1;
- otherwise, in the first line output a single integer k ($1 \le k \le 50\,000$), and then in k lines output the coordinates of the pieces: each line should contain two integers x_i and y_i ($-10^9 \le x_i, y_i \le 10^9$). If there are multiple suitable arrangements of the pieces, output any of them.

Examples

input
2 1 1 31 4

output
20 3 7 3 8 6 4 6 5 3 5 4 4 4 5 4 3 3 4 5 3

```
5 4
5 7
3 6
4 6
5 5
5 6
4 7
4 8
6 6
6 7
-1
```

input

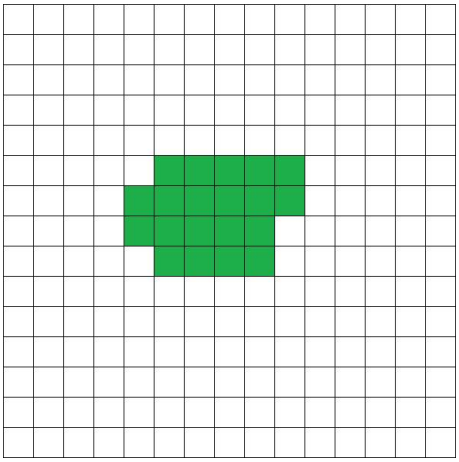
```
2
4 2
12 5
```

output

```
24
-7 2
-3 -3
-7 -5
-7 1
-3 2
-7 -2
-3 -5
-7 -6
-5 -6
-3 -4
-3 -6
-7 0
-6 -6
-7 -3
-5 2
-7 -1
-3 1
-4 -6
-3 0
-7 -4
-6 2
-4 2
-3 -1
-3 -2
5
0 0
0 1
1 0
-1 0
0 -1
```

Note

In the first test case of the first test, the figure may look like this:



In the second test, the figures look like this:

Educational Codeforces Round 179 (Rated for Div. 2)

Finished

Practice

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
322864172	Jun/04/2025 16:19	Accepted
322863840	Jun/04/2025 16:16	Wrong answer on test 29
322863063	Jun/04/2025 16:11	Wrong answer on test 29
322754068	Jun/03/2025 19:34	Wrong answer on test 3
322751904	Jun/03/2025 19:32	Wrong answer on test 2
322703768	Jun/03/2025 18:15	Wrong answer on test 1

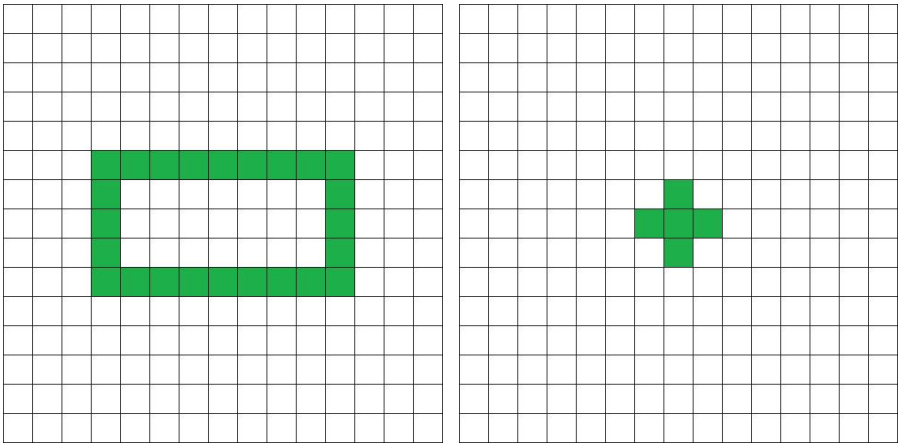
→ Problem tags

brute force | constructive algorithms | greedy | math

No tag edit access

→ Contest materials

- Announcement



Note that the internal perimeter is also taken into account!
