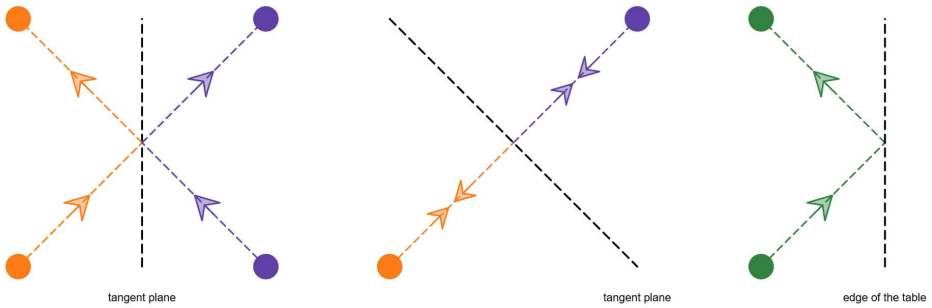
B. Square Pool

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

Aryan and Harshith are playing pool in universe AX120 on a fixed square pool table of side s with **pockets** at its 4 corners. The corners are situated at $(0, 0)$, $(0, s)$, $(s, 0)$, and (s, s). In this game variation, n identical balls are placed on the table with integral coordinates such that no ball lies on the edge or corner of the table. Then, they are all simultaneously shot at 10^{100} units/sec speed (only at 45 degrees with the axes).

In universe AX120, balls and pockets are almost point-sized, and the collisions are elastic, i.e., the ball, on hitting any surface, bounces off at the same angle and with the same speed.



Harshith shot the balls, and he provided Aryan with the balls' positions and the angles at which he shot them. Help Aryan determine the number of balls potted into the **pockets** by Harshith.

It is guaranteed that multiple collisions do not occur at the same moment and position.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \le t \le 1000$). The description of the test cases follows.

The first line of each test case contains two integers n and s ($1 \le n \le 10^3$, $2 \le s \le 10^9$) — the number of balls placed on the table and the side length of the square pool table.

The i-th of the next n lines contains four integers d_x, d_y, x_i, and y_i ($d_x, d_y \in \{-1, 1\}$, $0 < x_i, y_i < s$) — the direction vectors of the launch on the X-axis and Y-axis respectively, and the coordinates of the location where the i-th ball was placed. It is guaranteed that no two balls coincide at the initial moment.

It is also guaranteed that the sum of n over all test cases does not exceed 10^3.

Output

For each test case, print a single integer — the number of balls potted in that game.

Example

input

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


Codeforces Round 1033 (Div. 2) and CodeNite 2025
Contest is running
01:00:34
Contestant

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms
Choose file: Choose File No file chosen
Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.
Submit

→ Last submissions

Submission	Time	Verdict
325454656	Jun/21/2025 18:33	Pretests passed

→ Score table

	Score
Problem A	382
Problem B	573
Problem C	955
Problem D	1337
Problem E	1910
Problem F	2292
Problem G	3056
Successful hack	100
Unsuccessful hack	-50
Unsuccessful submission	-50
Resubmission	-50

* If you solve problem on 00:59 from the first attempt

→ Contest materials

Statements #1 (ru)

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

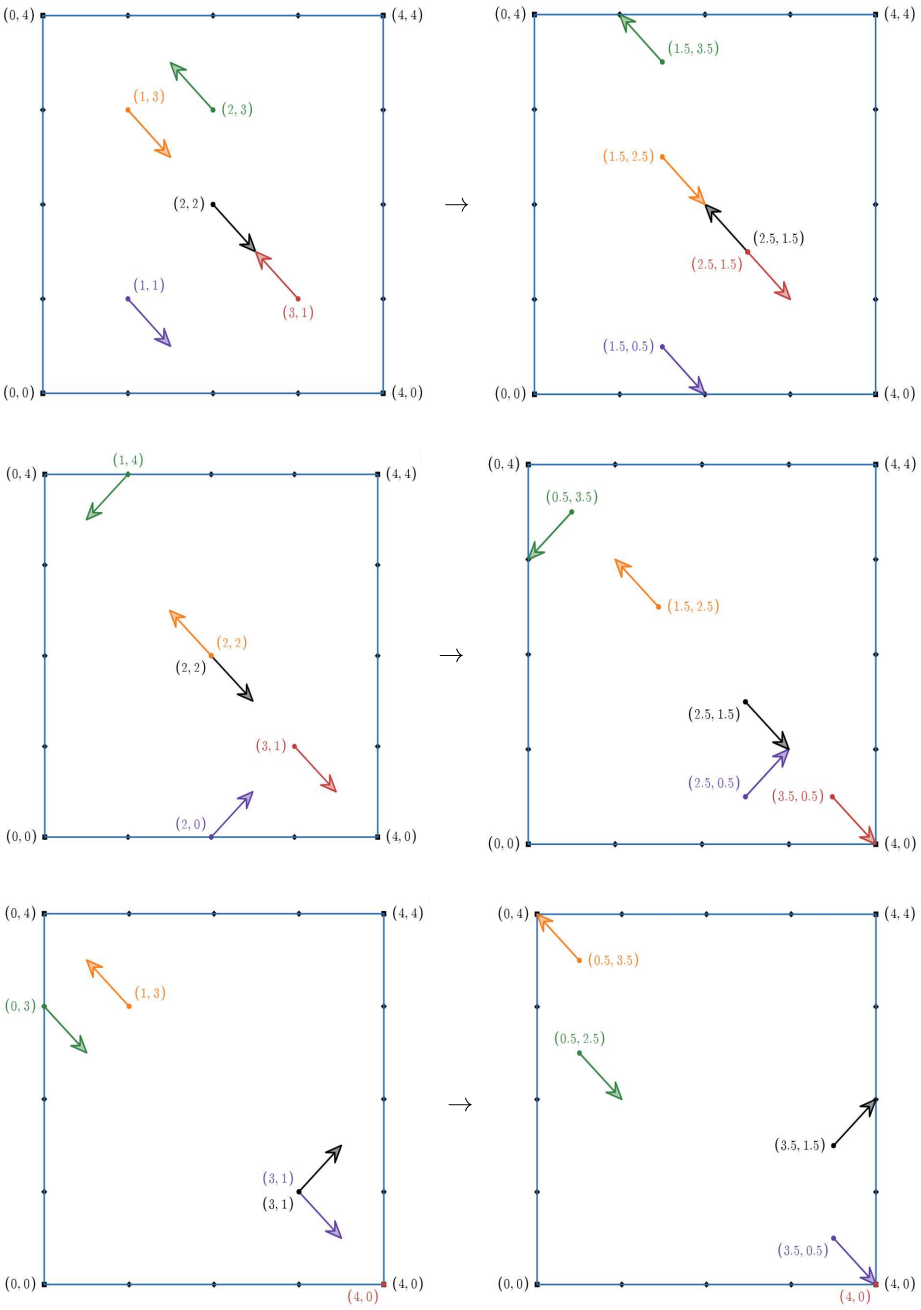
output Copy

```
1
3
```

Note

In the first test case, there is a single ball and it's shot directly towards the pocket at $(2, 2)$, thus potted.

In the second test case, the state progresses as



Statements #2 (en)