Clique

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

There are n robots on the plane, i-th of them is at point (x_i, y_i). Robots numbered from 1 to a are colored red, robots numbered from $a+1$ to $a+b$ are colored green, the rest are colored blue.

Each robot are going to make m moves. In one move, a robot at (x, y) can go to $(x+1, y)$, $(x-1, y)$, $(x, y+1)$ or $(x, y-1)$. After m moves, the robots with the same color are in the same position, and no two robots with different color are in the same position.

You want to know how many different ways of moving can lead to such situation. Two ways are different if one of the final positions is different or there is at least one robot whose moving path is different.

Input

The input contains multiple test cases. For each test case:

The first line contains four integers n, a, b and m ($3 \le n \le 1000, 1 \le a, b < n, a+b < n, 1 \le m \le 1000$).

The next n lines, each contains two integers x_i and y_i ($|x_i|, |y_i| \le 1000$) denoting the position of i-th robot.

The sum of values of n in all test cases doesn't exceed 1000.

Output

For each test case, output the number of ways module 10^9+7.

Examples

standard input	standard output
3 1 1 1 0 0 0 1 0 2 3 1 1 4 0 0 0 1 0 2	60 15974400