UCF "Practice" Local Contest — Aug 29, 2015

Magic Beans

filename: `magicbeans`
(*Difficulty Level:* `Hard`)

Peter loves magic beans. It turns out that the beans make it very easy to travel from place to place in his country, the Cartesian Coordinate System. To travel, Peter merely eats a bean and ends up in a new place!

Each bean teleports Peter in a predictable way. Say Peter is at position (x, y) on the plane. If he eats a bean it will teleport him to cell (x+a, y+b) where ***a*** and ***b*** are numbers written on the bean. Your task is to find the number of ways Peter can reach his destination location by eating beans. Peter's starting location is (0, 0). Two ways are considered different if it causes Peter to eat a different number of beans or the i^{th} bean eaten differs. (Note: Peter may arrive at his destination prematurely as long as his final destination is reached when he completes eating beans. Also note that if two different beans contain the same values ***a*** and ***b***, those beans are considered different from one another.)

The Input:

The first line of input contains a single positive integer ***t*** (***t*** ≤ 50), the number of journeys to process. For each journey, the first line contains three integers ***n***, ***dx***, ***dy*** ($1 \le n \le 32$, $-10^9 \le dx, dy \le 10^9$), representing the number of beans available to Peter, the x coordinate of his destination and the y coordinate of his destination location, respectively. Peter's destination will never be his starting location.

The next ***n*** lines contain two integers a_i and b_i, ($-10^9 \le a_i, b_i \le 10^9$), representing the numbers written on each bean.

The Output:

For each journey, output a single integer on a line by itself representing the number of ways Peter can eat the beans. As this number can get large, output the result modulo 1,000,000,007.

Sample Input:	Sample Output:
3 3 2 2 3 3 -1 -1 2 2 6 5 3 2 1 2 2 1 0 -2 -2 3 3 2 0 4 2 2 1 1 1 1 -1 2 1 -2	3 32 26

In the last sample case, we count all 4! orderings of eating all four beans which take Peter to (2,2), treating bean 1 and bean 2 as different beans, even though they have the same values ***a*** and ***b*** written on them. Note that some of these 4! orderings included visiting the destination (2, 2) in the middle of the journey. The last two ways we can get to (2,2) is by just eating bean 1 followed by bean 2, or eating bean 2 followed by bean 1.