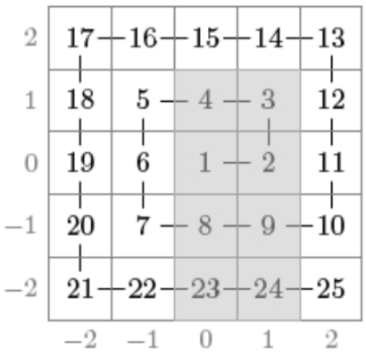
Problem K: Kid's Spiral Problem
Time Limit: 5 seconds

Description



A spiral on a grid of size (*2n+1*) x (*2n+1*) has been constructed as follows. Number 1 is in the center square at *(0, 0)*, number 2 is to the right of it at *(1, 0)*, and then we continue place the positive integers in order along the spiral in counterclockwise fashion. Now, given 2 coordinates indicating 2 corners of a rectangle, find the sum of all numbers in the enclosing rectangle. See the figure above for example.

Input

A number of of inputs (≤**100**), each starting with line contains two integers and n ($1 \le n \le 10^9$) and q ($1 \le q \le 100$): the size of the grid and the number of queries. After this, there are lines, each containing four integers (x_1, y_1) and (x_2, y_2) in that order, where $-n \le x_1, y_1, x_2, y_2 \le n$. This is the 2 corners of the rectangle in cartesian 2D coordinates. See the diagram, 1 is at the center at (0,0).

Output

For each input, output the answer modulo **1000000007**.

Sample Input

```
2 3
0 -2 1 1
-1 0 1 0
1 2 1 2
```

Sample Output

```
74
9
14
```