ACM-ICPC 2016
Thailand Central A & B Contest
SEPTEMBER 11, 2016

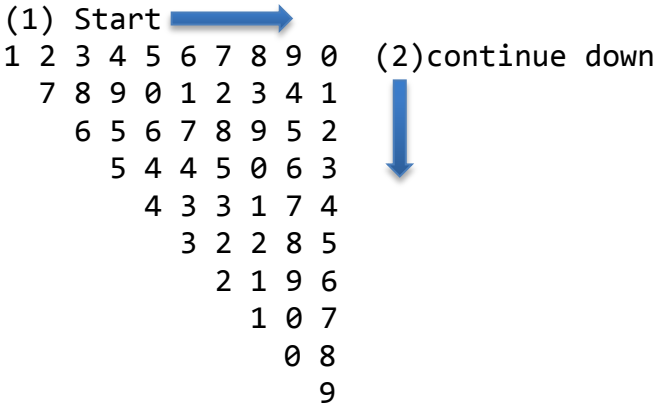
A Cyclic Triangle

Time Limit	5 second

Consider an **N**-by-**N** array where only the upper triangular area is filled with numbers (refer to figures below). This has the shape of a right triangle, whose legs have length **N**. In this array, the columns are numbered 0 through **N** – 1 (from left to right) and likewise, the rows are numbered 0 through **N** – 1 (from top to bottom).

The numbers in the right triangle are filled counterclockwise: Start from the horizontal leg on row 0, continue down the vertical leg, and move up diagonally to the left to then begin row 1, repeatedly filling the triangle in this circular fashion until the area is completely full. We fill the area, counting from 1 to 9, then back to 0 before continuing to count 1, 2, 3, and so on. Hence, all the numbers are between 0 and 9 (inclusive).

For the case of N = 10, the resulting table is shown below. For this example, we filled the triangle from (1) to (2) and then back toward (1) along the diagonal.



What is more interesting is to find out what the number is at a given row and column once we know **N.** From the example, where N = 10, if the position is row = 0, and column = 7, then it is filled with number 8. However, if the position is row = 5 and column is 7, then the number is 2. You task is to write a program that can quickly find out the number in the right triangle given the row and column.

Input

The first line contains a single number $T \leq 10$ representing the number of test cases. For each test case, the input is (Q + 1)-line long. The first line of each test case contains two positive integers, N and Q (separated by a single space). N is the size of the triangle, and Q is the number of positions

that you have to find out which number has been filled at each position. $5 \le N \le 1{,}000{,}000$ and $2 \le Q \le 10$. For the next Q lines, each line contains two numbers, R and C (separated by a single space), where R and C are the row and column we are interested in; the row and column are 0-indexed and $0 \le R \le C < N$.

Output

For each position R and C of interest, print out the number at that position on a single line, as shown in the output.

Sample Input/Output

Input	Output
2 12 5 7 8 0 0 11 11 5 10 2 7 1000000 6 7000 8000 5212 6824 700000 999999 5000 72913 900000 955555 8775 57412	2 1 3 6 1 8 0 0 4 8 3

Explanation

The figures in the table below show the triangles of N = 11, 12 and 13. You can use them to test the program.

11	12 (The highlighted numbers are the results of the test cases in the sample input/output.)
1 2 3 4 5 6 7 8 9 0 1 0 1 2 3 4 5 6 7 8 2 9 1 2 3 4 5 6 9 3 8 0 3 4 5 7 0 4 7 9 2 6 8 1 5 6 8 1 9 2 6 5 7 0 3 7 4 6 4 8 3 5 9 2 0 1	**1** 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 2 7 8 9 0 **1** 2 3 3 4 1 6 2 3 4 5 4 4 5 0 5 1 8 6 5 5 6 9 4 0 7 6 **6** 7 8 3 9 7 7 8 7 **2** 8 8 9 6 1 9 0 5 0 1 4 2 **3**

13	
1 2 3 4 5 6 7 8 9 0 1 2 3 6 7 8 9 0 1 2 3 4 5 6 4 5 3 4 5 6 7 8 9 0 7 5 4 2 1 2 3 4 5 1 8 6 3 1 0 0 1 6 2 9 7 2 0 9 9 7 3 0 8 1 9 8 8 4 1 9 0 8 7 5 2 0 9 7 6 3 1 8 6 4 2 7 5 3 6 4 5	