

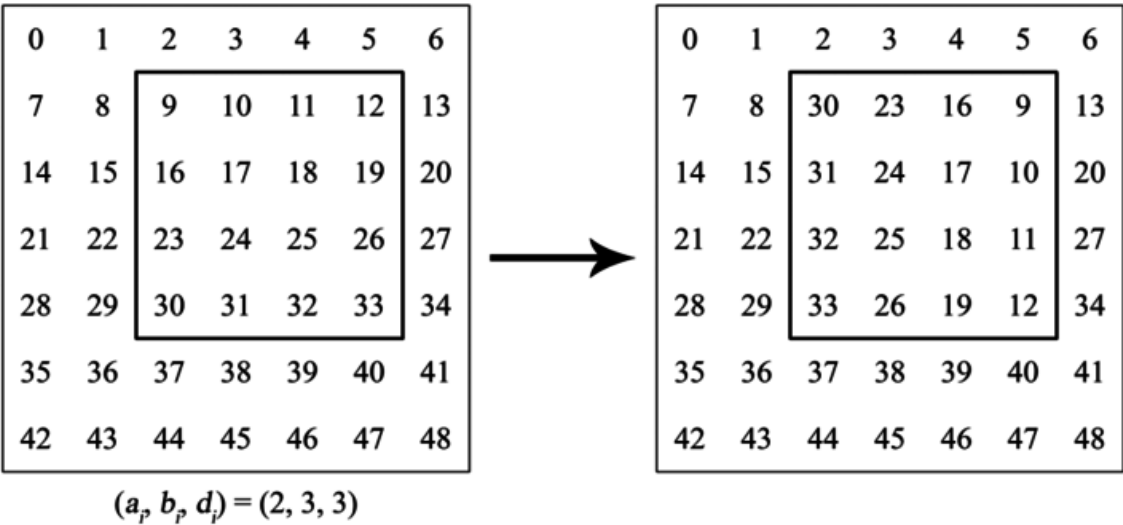
King Richard's Knights

King Richard is leading a troop of N^2 knights into battle! Being very organized, he labels his knights $K_0, K_1, \dots, K_{N^2-1}$ and arranges them in an $N \times N$ square formation, demonstrated below:

N columns				
K_0	K_1	K_2	...	K_{N-1}
K_N	K_{N+1}	K_{N+2}	...	K_{2N-1}
K_{2N}	K_{2N+1}	K_{2N+2}	...	K_{3N-1}
...
$K_{N(N-1)}$	$K_{N(N-1)+1}$	$K_{N(N-1)+2}$...	K_{N^2-1}
N rows				

Before the battle begins, he wants to test how well his knights follow instructions. He issues S drill commands, where each command follows the format $a_i \ b_i \ d_i$ and is executed like so:

- All knights in the square having the top-left corner at location (a_i, b_i) and the bottom-right corner at location $(a_i + d_i, b_i + d_i)$ rotate 90° in the clockwise direction. Recall that some location (r, c) denotes the cell located at the intersection of row r and column c . For example:



You must follow the commands sequentially. The square for each command is completely contained within the square for the previous command. Assume all knights follow the commands perfectly.

After performing all S drill commands, it's time for battle! King Richard chooses knights $K_{w_1}, K_{w_2}, \dots, K_{w_L}$ for his first wave of attack; however, because the knights were reordered by the drill commands, he's not sure where his chosen knights are!

As his second-in-command, you must *find the locations of the knights*. For each knight K_{w_1} , K_{w_2}, \dots, K_{w_L} , print the knight's *row* and *column* locations as two space-separated values on a new line.

Input Format

This is broken down into three parts:

- 1. The first line contains a single integer, N .
- 2. The second line contains a single integer, S .
 - Each line i of the S subsequent lines describes a command in the form of three space-separated integers corresponding to a_i , b_i , and d_i , respectively.
- 3. The next line contains a single integer, L .
 - Each line j of the L subsequent lines describes a knight the King wants to find in the form of a single integer corresponding to w_j .

Constraints

- $1 \leq S \leq 2 \cdot 10^5$
- $7 \leq N \leq 3 \cdot 10^7$
- $1 \leq a_i, b_i \leq N$
- $0 \leq d_i < N$
- $a_{i-1} \leq a_i$ and $a_i + d_i \leq a_{i-1} + d_{i-1}$
- $b_{i-1} \leq b_i$ and $b_i + d_i \leq b_{i-1} + d_{i-1}$
- $1 \leq L \leq 2 \cdot 10^5$
- $0 \leq w_j < N^2$

Subtask

- $7 \leq N \leq 3000$ for 25% of the maximum score.

Output Format

Print L lines of output, where each line j contains two space-separated integers describing the respective *row* and *column* values where knight K_{w_j} is located.

Sample Input

```
7
4
1 2 4
2 3 3
3 4 1
3 4 0
7
0
6
9
```

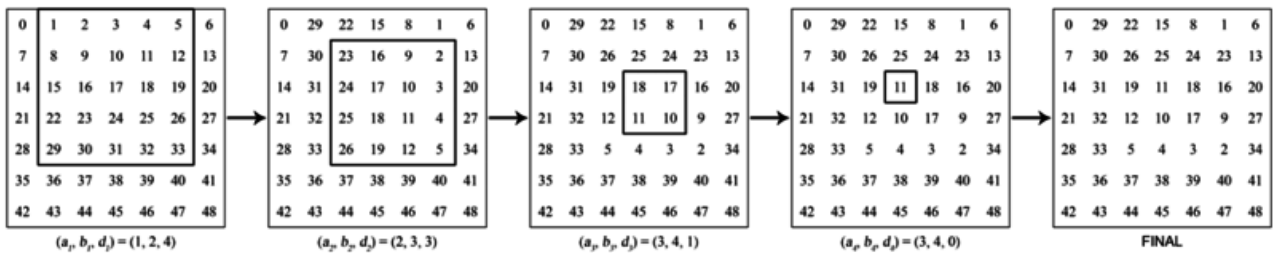
11
24
25
48

Sample Output

1 1
1 7
4 6
3 4
2 5
2 4
7 7

Explanation

The following diagram demonstrates the sequence of commands:



Click [here](#) to download a larger image.

In the final configuration:

- Knight K_0 is at location $(1, 1)$
- Knight K_6 is at location $(1, 7)$
- Knight K_9 is at location $(4, 6)$
- Knight K_{11} is at location $(3, 4)$
- Knight K_{24} is at location $(2, 5)$
- Knight K_{25} is at location $(2, 4)$
- Knight K_{48} is at location $(7, 7)$