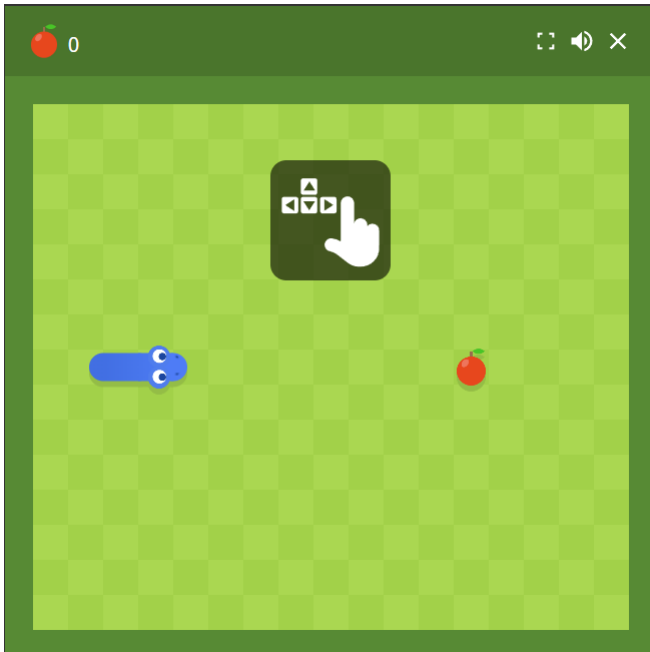


Snake

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

Shor the Duck is playing Snake!



However, in Shor's Nest (the official new name for Duckland; btw you can join Shor's Nest on Discord: Check out the Shamelessad problem series!), the rules of the game have been modified to make it child-friendly. In this game, The playing field is now an infinitely large grid (children will cry when the snake hits a wall and dies), and there are no apples for the snake to eat to increase in length (children will be frightened at the sight of mutation), and the snake won't die even if the snake bumps into itself.

If you don't know the rules of the original game of Snake, ignore everything mentioned above. Basically: there is a snake of consisting of N parts numbered 1 to N on a 2D coordinate plane, with part 1 being its head. Initially, part i of the snake is located at the coordinates $(i, 0)$. Q queries as follows:

- 1 C : Move the head by 1 in direction C . Here, C is one of R, L, U , and D , which represent the positive x -direction, negative x -direction, positive y -direction, and negative y -direction, respectively. Each part other than the head moves to follow the part in front of it. That is, part i ($2 \leq i \leq N$) moves to the coordinates where part $i - 1$ was before the move.
- 0 p : Find the coordinates of part p .

Help Shor program the game!

Input

The first line of input will contain two integers, N and Q , the length of the snake and the number of queries.

The following Q lines of input consists of an integer, x . If $x = 1$, then you are given a character C , the position that the snake's head is moving to. If $x = 0$, then you are given an integer p .

Output

For each of the Q queries, if $x = 0$, then you are to print the coordinates of the p -th part of the snake.

Scoring

For all test cases, it is guaranteed that:

- $1 \leq N, Q \leq 5 \cdot 10^5$
- For all type 1 queries, C is either L, R, U or D .
- For all type 0 queries, $1 \leq p \leq N$.

Subtask	Score	Additional constraints
1	10	All type 1 queries will have $C = R$.
2	20	$N, Q \leq 1000$
3	30	All type 1 queries will have $C = R$ or $C = L$
4	40	No further constraints
5	0	Sample test cases

Example

standard input	standard output
5 9 0 3 1 U 0 3 1 R 1 D 0 3 1 L 0 1 0 5	3 0 2 0 1 1 1 0 1 0

Note

At each time when processing the second type of query, the parts are at the following positions:

