Minimum Deque

Input file:	`standard input`
Output file:	`standard output`
Time limit:	0.25 seconds
Memory limit:	1024 megabytes

Being a literal child, bribritt has only just learnt about deques!

Now, he has developed a new data structure, called a MinDeque! It can support the following operations:

1 x. Push x, which is either 0 or 1, to the back of the deque.

2. Delete the element at the back of the deque.

3 x. Push x, which is either 0 or 1, to the front of the deque.

4. Delete the element at the front of the deque.

5. Find the minimum element in the deque.

Help him support these 5 operations!

Input

The first line contains an integer Q, the number of queries.

The next Q lines contain operations of the form 1 x, 2, 3 x, 4 or 5.

Output

For each operation of type 5, output a single integer, the minimum element in the deque.

Scoring

For all testcases,

- $x = 0$ or $x = 1$
- Type 2, 4 and 5 operations are NOT called when the deque is empty
- $Q \leq 10^6$

Subtask	**Score**	Q	**Additional constraints**
1	20	$\leq 10^3$	—
2	15	$\leq 2 \times 10^5$	$x = 0$
3	15		No operations of type 2 or 4
4	49		—
5	1	$\leq 10^6$	
6	0	$= 5$	Sample testcase

Example

`standard input`	`standard output`
5 1 0 3 1 5 2 5	0 1

Note

After the first two operations, the deque is $\{1, 0\}$, so the minimum value in the deque is 0. Then, we pop 0, so the deque is now $\{1\}$ and the minimum value in the deque is 1.