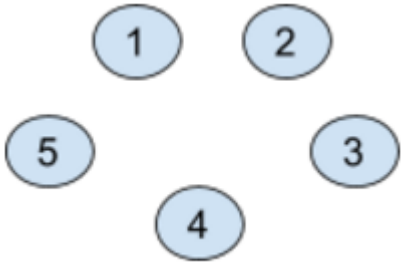
DSA Lab 5 Set 1 | **ListOfBalloons**

Read through the game as described. N children, each with one balloon, are made to stand in a circle. Each balloon is numbered distinctly from $1, 2, 3...N$ in this sequence. Child with balloon 1 has a pin. He bursts balloon 2 next to him/her with the pin and passes the pin to next child with balloon 3 who further bursts balloon 4 and passes pin to child with balloon 5 and so on. A child moves out of the circle as soon as his/her balloon is bursted. This bursting and passing continues until only one child is left in the circle, who is the winner of the game. Your task is to return the value(the number) on the balloon of the winner. Make use of the circular linked list data structure to proceed with the operations on the nodes and find out the winner. For reference, please look at a sample game below.



For $N = 5$, 1 bursts 2 and passes pin to 3. 3 bursts 4 and passes pins to 5. 5 bursts 1 and passes pin to 3. 3 bursts 5 and it has no node to pass to. Hence, 3 is the winning balloon.

Input

The first line contains an integer T denoting the number of test cases. Next T lines contain an integer N in each line, denoting the number of children initially for each test case.

Constraints:

Basic:

$1 \leq T \leq 10$

$1 \leq N \leq 100$

Advanced:

$1 \leq T \leq 10$

$1 \leq N \leq 10000$

Output

Output T lines with an integer in each line, denoting the value of winning balloon in the corresponding test case.

Sample

Input:

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3

5

1

8
```

Output:

3

1

1