PROBLEM 3

Outbreak

Time and memory limits: 1 second, 256 MB

Recent reports from remote hospitals in *Oddland* indicate the spread of a new disease epidemiologists have termed *chronic vicinal medianopathy* (CVM). You and your team of scientists have been sent to an affected village in an attempt to study its behaviour.

The village in question initially consists of N infected villagers living along a straight road, numbered from 1 to N down the road. The ith villager has a *personality value* given by the integer A_i, and their *neighbours* are the living villagers directly next to them. Note that villagers 1 and N have only one neighbour.

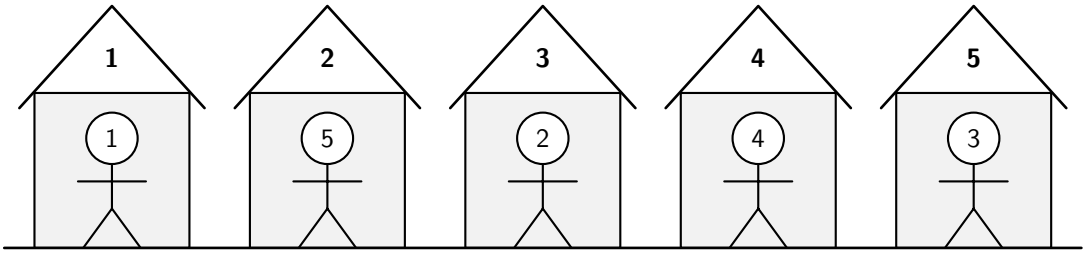


Figure 1: Example village with $N = 5$ villagers.

Every night, CVM kicks into effect. The two villagers with only one living neighbour do not survive the night. Meanwhile, everyone else experiences an uncanny progression of symptoms: CVM replaces their personality with the **median**[1] of their own personality and the personality values of their two neighbours.

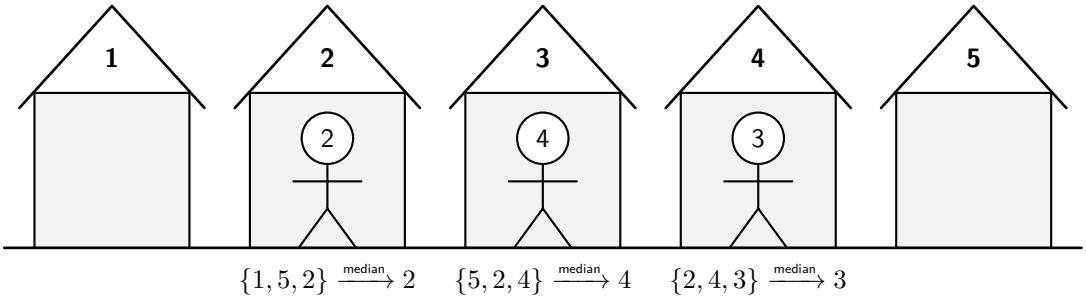


Figure 2: The village in Figure 1 after one night.

Note that these changes happen **simultaneously** across all villagers, so the new value of each villager is always based on their own previous value and the previous values of their two neighbours.

Your job is to study the very last stage of the outbreak. In particular, after some number of nights, only one[2] villager will remain alive. You wish to determine this villager's final personality value.

[1] Recall that the median of three numbers is the middle value after sorting them in order of size.

[2] As we are in *Oddland*, N is always odd, and hence the existence of this villager is guaranteed.

Subtasks and Constraints

Your program will be graded using many secret tests. Every test follows some rules:

- $3 \leq N \leq 200\,000$.
- $1 \leq A_i \leq N$.
- N is odd.

The secret tests are divided into subtasks. Your program must correctly solve **every test** within a subtask to earn the marks for that subtask:

- For Subtask 1 (15 points), $N \leq 1000$.
- For Subtask 2 (20 points), $1 \leq A_i \leq 2$ for all i, and no two $A_i = 1$ are adjacent.
- For Subtask 3 (25 points), $1 \leq A_i \leq 2$ for all i.
- For Subtask 4 (25 points), $1 \leq A_i \leq 10$ for all i.
- For Subtask 5 (15 points), no special rules apply.

Input

Your solution must read input and print output. We recommend using the solution templates (which you can find on the competition website) to help you with input and output.

The input follows a specific format:

- The first line contains the integer N.
- The second line contains N integers $A_1, A_2, \ldots, A_N$, the initial personality values of each villager.

Output

Your program must output the personality value of the last living villager.

Sample Input 1

```
5
1 5 2 4 3
```

Sample Output 1

```
3
```

Sample Input 2

```
5
1 2 1 2 2
```

Sample Output 2

```
2
```

Explanation

- The 1st sample case is shown in the problem statement as Figure 1. After two nights, only the middle villager remains alive, with a personality value of 3 (median of 2, 4, and 3).
- The 2nd sample case is illustrated below:

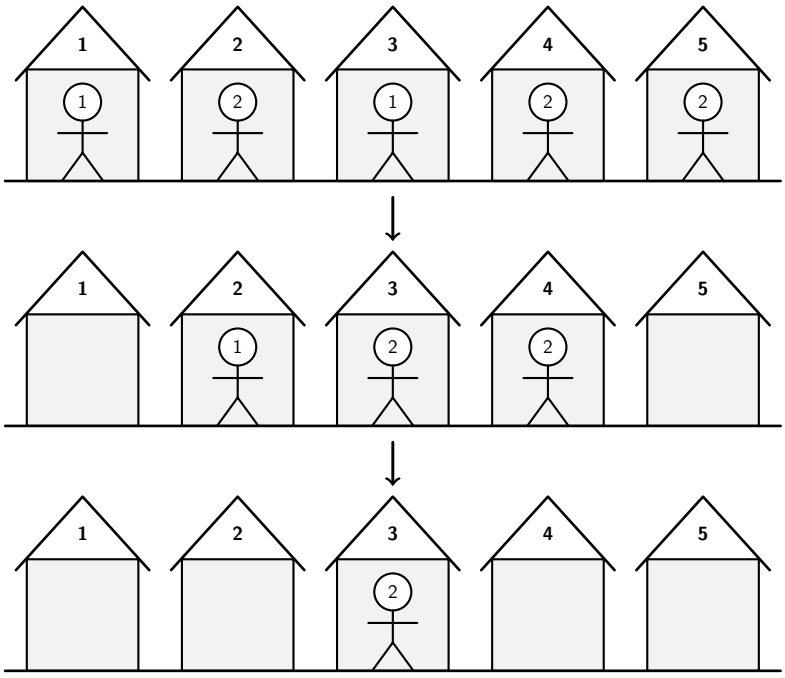


Figure 3: CVM progression for the second sample case.