

Contest Duration: 2025-06-21(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250621T2100&p1=248>) - 2025-06-21(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250621T2240&p1=248>) (local time) (100 minutes)

[Back to Home \(/home\)](#)

[Top \(/contests/abc411\)](#)

[Tasks \(/contests/abc411/tasks\)](#)

[Clarifications \(/contests/abc411/clarifications\)](#) [Results ▾](#)

[Standings \(/contests/abc411/standings\)](#)

[Virtual Standings \(/contests/abc411/standings/virtual\)](#) [Editorial \(/contests/abc411/editorial\)](#)

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## C - Black Intervals

[Editorial \(/contests/abc411/tasks/abc411\\_c/editorial\)](#)

Time Limit: 3 sec / Memory Limit: 1024 MiB

Score : 350 points

### Problem Statement

There are  $N$  squares arranged in a row from left to right. Initially, all squares are painted white.

Process  $Q$  queries in order. The  $i$ -th query gives an integer  $A_i$  between 1 and  $N$ , inclusive, and performs the following operation:

Flip the color of the  $A_i$ -th square from the left. Specifically, if the  $A_i$ -th square from the left is painted white, paint it black; if it is painted black, paint it white.

Then, find the number of intervals of consecutively painted black squares.

Here, an interval of consecutively painted black squares is a pair of integers  $(l, r)$  ( $1 \leq l \leq r \leq N$ ) that satisfy all of the following:

- The  $l$ -th,  $(l + 1)$ -th,  $\dots$ ,  $r$ -th squares from the left are all painted black.
- Either  $l = 1$ , or the  $(l - 1)$ -th square from the left is painted white.
- Either  $r = N$ , or the  $(r + 1)$ -th square from the left is painted white.

### Constraints

- $1 \leq N, Q \leq 5 \times 10^5$
- $1 \leq A_i \leq N$

2026-01-02 (Fri)  
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- All input values are integers.
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## Input

The input is given from Standard Input in the following format:

```
N Q  
A1 A2 ... AQ
```

## Output

Output  $Q$  lines. On the  $i$ -th line ( $1 \leq i \leq Q$ ), output the answer to the  $i$ -th query.

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### Sample Input 1

[Copy](#)

```
5 7  
2 3 3 5 1 5 2
```

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### Sample Output 1

[Copy](#)

```
1  
1  
1  
2  
2  
1  
1
```

[Copy](#)

Below, the  $i$ -th square from the left is referred to as square  $i$ .

After each query, the state is as follows:

- After the 1st query, only square 2 is painted black. There is 1 interval of consecutively painted black squares:  $(l, r) = (2, 2)$ .
- After the 2nd query, squares 2, 3 are painted black. There is 1 interval of consecutively painted black squares:  $(l, r) = (2, 3)$ .
- After the 3rd query, only square 2 is painted black. There is 1 interval of consecutively painted black squares:  $(l, r) = (2, 2)$ .
- After the 4th query, squares 2, 5 are painted black. There are 2 intervals of consecutively painted black squares:  $(l, r) = (2, 2), (5, 5)$ .
- After the 5th query, squares 1, 2, 5 are painted black. There are 2 intervals of consecutively painted black squares:  $(l, r) = (1, 2), (5, 5)$ .

- After the 6th query, only squares 1, 2 are painted black. There is 1 interval of consecutively painted black squares:  $(l, r) = (1, 2)$ .
- After the 7th query, only square 1 is painted black. There is 1 interval of consecutively painted black squares:  $(l, r) = (1, 1)$ .

Thus, output 1, 1, 1, 2, 2, 1, 1 separated by newlines.

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## Sample Input 2

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```
1 2  
1 1
```

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## Sample Output 2

[Copy](#)

```
1  
0
```

[Copy](#)

After the 2nd query, all squares are painted white, so output 0 on the 2nd line.

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## Sample Input 3

[Copy](#)

```
3 3  
1 3 2
```

[Copy](#)

## Sample Output 3

[Copy](#)

```
1  
2  
1
```

[Copy](#)

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