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Play with 0/1 Bit



Problem

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You are given an array with N elements, indexed from 1 to N. There are three types of query.

Type - 1: " *q | r 0*" means that you have to print the number x which has the maximum number of 0's in the binary representation of all elements between position I and r of the array . **If there are many numbers having maximum 0's then output the maximum number.**

Type - 2: " *q | r 1*" means that you have to print the number x which has the minimum number of 1's in the binary representation of all elements between position I and r of the array . If there are many numbers having minimum 1's then output the minimum number.

Type - 3: " *u i x*" means that you have to replace the value of the position i by x of the array.

Input Format

First line contains N indicating the number of elements. The the next line contains N space separated integers forming the array. The integers range in [1,10^5]. The next line contains an integer q denoting the number of queries. Each query is any of the three types described above.

Constraints

1 <= N, q <= 10^5

1 <= x <= 10^5

1 <= i, l, r <= N

Output Format

Output each query (Type - 1 and Type - 2) in a separate line

Sample Input 0

5 1 2 3 4 5

3

q 1 3 0 u 3 5

q 3 2 0

Sample Output 0

2

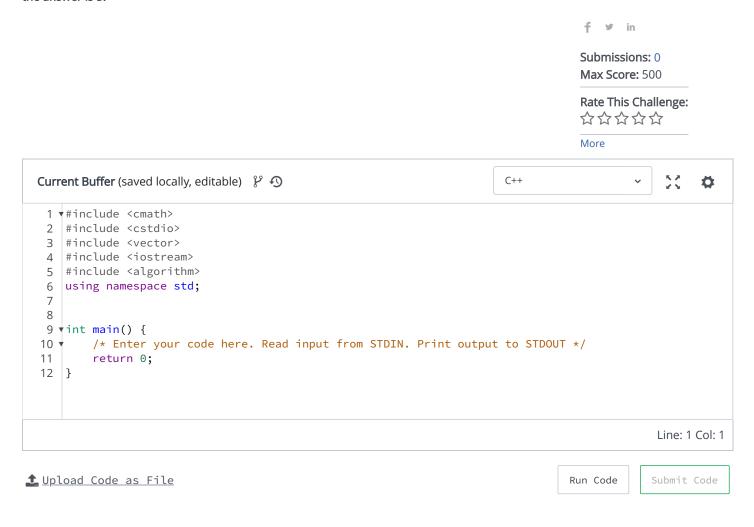
5

Explanation 0

The binary representations of the array elements are: 1, 10, 11, 100, 101

There are 3 queries.

- 1. Between positions 1 and 3, 2nd element has maximum 0's in its binary representation. So, the answer is 2.
- 2. Replace 3rd element by the value 5. So, the binary representation of the new array is 1, 10, 101, 100, 101
- 3 . Between positions 3 and 2, the 2nd and 3rd element has maximum 0's in its binary representation. **Again max of 2 and 5 is 5. So, the answer is 5.**



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