Problem G. Another (interval)^2 problem

Time limit 1000 ms
Memory limit 256MB

Problem Description

Good morning, everyone. I have an array A of length n $(A_1, A_2, ..., A_n)$.

Good afternoon, everyone. Now in Fontaine, there is a person named Furina.

Furina is a university student who is very fond of perfect squares, so she wants to know the maximum perfect square in a subarray $[L, R]$ of this array A. Because Furina loves perfect squares so much, she might ask this question repeatedly.

However, unfortunately, the numbers in this array often change, which makes Furina very sad. BAD ARRAY.

So, to save Furina's good mood, please help her out!

p.s. A positive integer x is a perfect square if and only if $\sqrt{x}$ is a positive integer.

Input format

The first line contains two positive integers n and Q $(1 \leq n, Q \leq 200000)$, representing the length of the array A and the number of operations, respectively.

The second line contains n positive integers, where the i-th number represents the element A_i of the array A $(1 \leq A_i \leq 1000000,\ \forall 1 \leq i \leq n)$.

The next Q lines each start with a number op $(1 \leq op \leq 2)$:

- If $op = 1$, the same line will also contain two positive integers x and v $(1 \leq x \leq n,\ 1 \leq v \leq 1000000)$, indicating that A_x should be updated to v.
- If $op = 2$, the same line will also contain two positive integers L and R $(1 \leq L \leq R \leq n)$, indicating that Furina wants to know the maximum perfect square in the subarray $[L, R]$.

It is guaranteed that there will be at least one $op = 2$.

Output format

For each $op = 2$, output a positive integer k, representing the maximum perfect square in the requested range. If there are no perfect squares in the range, output -1. Make sure to output each result on a new line.

Subtask score

Subtask	Score	Additional Constraints
1	25	$1 \leq n, Q \leq 2000$
2	25	All A_i are perfect squares, and there is no $op = 1$ operations occur
3	25	It is guaranteed that when $op = 2$, $L = 1$
4	25	No constraints

Sample

Sample Input 1

```
10 10
9 72 55 81 9 48 25 44 36 9
1 2 33
1 10 35
2 10 10
2 5 6
1 4 9
2 8 10
1 8 4
2 4 9
2 5 10
2 5 5
```

Sample Output 1

```
-1
9
36
36
36
9
```

Sample Input 2

```
9 8
94 25 49 36 53 1 94 95 100
1 5 16
2 1 5
2 6 6
2 2 8
1 6 80
2 2 9
2 1 4
2 6 7
```

Sample Output 2

```
49
1
49
100
49
-1
```

Notes

You may see a similar problem in Lab2 again.