

Cubic Bushes

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 512 megabytes

Boy Petya often walks with his mother in the park "Dekartgof.Dekartgof" is a classic park known for its strict shapes and straight lines.

One of the attractions of "Dekartgof" is the Alley of Cubic Bushes. A cubic bush is a plant made up of several identical cubic segments stacked on top of each other. There are a total of n bushes planted in a row in the Alley of Cubic Bushes. Petya is passionate about geometry, so he particularly enjoys walking through this alley. On his first visit to the alley, Petya recorded the height of each bush. The height of the bushes is the number of cubic segments in it.

In the Alley of Cubic Bushes, Petya especially likes symmetry, so he looks for sequences of bushes whose heights form a stepped palindrome. A stepped palindrome is a sequence of odd length where, in the first half, the height of each subsequent bush increases by one compared to the previous one, with the tallest bush in the center of the sequence, and then the heights of the bushes decrease by one until the end of the sequence. The heights of the bushes at equal distances from the center are the same. For example, $[1, 2, 3, 2, 1]$ is a stepped palindrome, while $[1, 2]$ and $[1, 5, 2]$ are not. Among all stepped palindromes, Petya wants to find the longest one.

Petya visits the park every month. The gardeners in "Dekartgof" try to trim the cubic bushes so that the alley always looks the same, but Petya noticed that during each visit to the park, one of the bushes changes its height, so the length of the longest stepped palindrome may change.

Petya is still young and cannot solve the problem, so help him find the maximum length of the stepped palindrome during his first visit to the park and in all subsequent visits.

Input

The first line contains one number n — the number of bushes in the alley ($1 \leq n \leq 10^5$).

The second line contains n numbers a_i — the initial heights of the bushes ($1 \leq a_i \leq 10^7$).

The third line contains one number q — the number of weeks when Petya visited the park ($1 \leq q \leq 10^5$).

In the following q lines, there are two numbers i x — the height of bush i has become x ($1 \leq i \leq n$, $1 \leq x \leq 10^7$).

Output

Output $q + 1$ lines — the maximum length among the stepped palindromes during Petya's first visit to the park and in all subsequent visits.

Example

standard input	standard output
5	3
3 4 3 2 1	1
3	3
3 5	5
4 4	
5 3	