Problem C. Operations

You are given a sequence a of n integers. You need to apply m operations on this sequence. Each of the operations has one of three types:

- 1 x v – set a_x to v. ($1 \le x \le n$, $|v| \le 100000$)
- 2 l r – return $\max(a_i + a_{i+1} + \ldots + a_j)$ with $l \le i \le j \le r$. In other words, you should print the maximum sum of non-empty set of contiguous elements between l to r on sequence a.
- 3 k – return the sequence in a state after applying k-*th* operation. Note that $k = 0$ mean that the sequence should be in initial state.

Input

The first line of the input contains an integer n ($n \le 100000$)

The following line contains n integers, representing the sequence $a_1 a_2 \ldots a_n$ ($|a_i| \le 100000$)

The next line contains an integer m ($m \le 100000$)

The next m lines contain operations which are of the three types as described above

It is guaranteed that in each third-type operation, the number k corresponds to some operation before it.

Output

For each second-type operation, print an integer as described above.

Examples

Standard Input	Standard Output
5 -1 -2 4 3 5 6 2 1 5 1 2 1 2 1 3 3 0 1 1 3 2 1 5	12 5 13