Problem F

Difficult Questions

Time limit: 1 second
Memory: 1024 megabytes

Problem Description

Once upon a time, there was a prince in a certain kingdom named ***Nhat Tang***, who loved to pose difficult questions to his subjects, expecting them to solve them. One of the questions, however, was so challenging that even the prince couldn't find the answer.

The question is as follows: Given an array of positive integers **A** consisting of **N** elements and **M** operations that need to be performed on the array **A**:

- For the first operation with **Q = 0**:
  - You are given three non-negative integers **L**, **R**, and **X**. Your task is to increase the elements in the range **[L, R]** of the array by **X**.

- For the second operation with **Q = 1**:
  - You are given only one integer **K**. Your task is to find the **largest** position **i** such that the maximum value of the elements in the range **[1,i]** is less than or equal to **K**.

It seemed that no one could figure out a solution to this problem. However, rumors from another kingdom claimed that a deity could easily resolve it. Upon hearing this, ***Nhat Tang*** rode his warhorse to find the deity and asked for help to uncover the solution. You are that deity, so show the prince your skills!

Input:

- The first line: An integer **N** (where $\mathbf{N \leq 10^5}$).
- The next line: **N** integers $\mathbf{A_i}$ where $\mathbf{0 < i \leq N}$ and $\mathbf{A_i \leq 10^6}$.
- The next line: A positive integer **M** (where $\mathbf{M \leq 10^5}$).
- The next **M** lines: The operations of type one and type two.
  - For type **Q = 0**: The line contains **Q, L, R,** and **X**.
    - It holds that $\mathbf{0 < L \leq R \leq N}$ and $\mathbf{0 < X \leq 10^6}$.
  - For type **Q = 1**: The line contains **Q** and **K**.
    - It holds that $\mathbf{0 < K \leq 10^9}$.

Output:

- For each operation of type two, print the largest position that satisfies the condition on a new line

Example:

INPUT	OUTPUT
5 5 10 1 1 4 8 0 1 4 2 0 2 2 3 1 25 0 1 1 1 0 2 3 2 1 10 0 2 5 5 0 1 4 3	5 1

Explain:

- With M operations:

0 : 1 4 2 0 : 2 2 3 1 : 25 0 : 1 1 1 0 : 2 3 2 1 : 10 0 : 2 5 5 0 : 1 4 3	A : 7 12 3 3 4 A : 7 15 3 3 4 The **largest** position is 5 A : 8 15 3 3 4 A : 8 17 5 3 4 The **largest** position is 1 A : 8 22 10 8 9 A : 11 25 13 11 9