E. GukiZ and GukiZiana

time limit per test: 10 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Professor GukiZ was playing with arrays again and accidentally discovered new function, which he called $GukiZiana$. For given array a, indexed with integers from 1 to n, and number y, $GukiZiana(a, y)$ represents maximum value of j - i, such that $a_j = a_i = y$. If there is no y as an element in a, then $GukiZiana(a, y)$ is equal to -1. GukiZ also prepared a problem for you. This time, you have two types of queries:

1. First type has form $1\ l\ r\ x$ and asks you to increase values of all a_i such that $l \le i \le r$ by the non-negative integer x.
2. Second type has form $2\ y$ and asks you to find value of $GukiZiana(a, y)$.

For each query of type 2, print the answer and make GukiZ happy!

Input

The first line contains two integers n, q ($1 \le n \le 5 * 10^5$, $1 \le q \le 5 * 10^4$), size of array a, and the number of queries.

The second line contains n integers a_1, a_2, ... a_n ($1 \le a_i \le 10^9$), forming an array a.

Each of next q lines contain either four or two numbers, as described in statement:

If line starts with 1, then the query looks like $1\ l\ r\ x$ ($1 \le l \le r \le n$, $0 \le x \le 10^9$), first type query.

If line starts with 2, then th query looks like $2\ y$ ($1 \le y \le 10^9$), second type query.

Output

For each query of type 2, print the value of $GukiZiana(a, y)$, for y value for that query.

Examples

input
4 3 1 2 3 4 1 1 2 1 1 1 1 1 2 3

output
2

input
2 3 1 2 1 2 2 1 2 3 2 4

output
0 -1