

F. Two Subarrays

time limit per test: 3 seconds
memory limit per test: 512 megabytes

You are given two integer arrays a and b , both of size n .

Let's define the cost of the subarray $[l, r]$ as $a_l + a_{l+1} + \dots + a_{r-1} + a_r + b_l + b_r$. If $l = r$, then the cost of the subarray is $a_l + 2 \cdot b_l$.

You have to perform queries of three types:

- "1 $p\ x$ " — assign $a_p := x$;
- "2 $p\ x$ " — assign $b_p := x$;
- "3 $l\ r$ " — find **two non-empty non-overlapping subarrays** within the segment $[l, r]$ with the maximum total cost and print their total cost.

Input

The first line contains a single integer n ($2 \leq n \leq 2 \cdot 10^5$).

The second line contains n integers a_1, a_2, \dots, a_n ($-10^9 \leq a_i \leq 10^9$).

The third line contains n integers b_1, b_2, \dots, b_n ($-10^9 \leq b_i \leq 10^9$).

The fourth line contains a single integer q ($1 \leq q \leq 2 \cdot 10^5$).

The next q lines contain the queries: one per line. Each query is of one of three types:

- "1 $p\ x$ " ($1 \leq p \leq n$; $-10^9 \leq x \leq 10^9$);
- "2 $p\ x$ " ($1 \leq p \leq n$; $-10^9 \leq x \leq 10^9$);
- "3 $l\ r$ " ($1 \leq l < r \leq n$).

It is guaranteed that there is at least one query of the third type.

Output

For each query of the third type, print the maximum possible total cost of two non-empty non-overlapping subarrays within the segment $[l, r]$.

Examples

input

Copy

```
7
3 -1 4 -3 2 4 0
0 6 1 0 -3 -2 -1
6
3 1 7
1 2 0
3 3 6
2 5 -3
1 3 2
3 1 5
```

output

Copy

```
18
7
16
```

input

Copy

```
10
2 -1 -3 -2 0 4 5 6 2 5
```

Educational Codeforces Round 172 (Rated for Div. 2)

Finished

Practice



→ Virtual participation

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Language: GNU G++17 7.3.0

Choose file: Choose File No file chosen

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→ Contest materials

- Announcement 
- Tutorial #1 
- Video Tutorial (en) 