B. Kuriyama Mirai's Stones

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Kuriyama Mirai has killed many monsters and got many (namely n) stones. She numbers the stones from 1 to n. The cost of the i-th stone is v_i. Kuriyama Mirai wants to know something about these stones so she will ask you two kinds of questions:

1. She will tell you two numbers, l and r $(1 \le l \le r \le n)$, and you should tell her .
2. Let u_i be the cost of the i-th cheapest stone (the cost that will be on the i-th place if we arrange all the stone costs in non-decreasing order). This time she will tell you two numbers, l and r $(1 \le l \le r \le n)$, and you should tell her .

For every question you should give the correct answer, or Kuriyama Mirai will say "fuyukai desu" and then become unhappy.

Input

The first line contains an integer n $(1 \le n \le 10^5)$. The second line contains n integers: $v_1, v_2, ..., v_n$ $(1 \le v_i \le 10^9)$ — costs of the stones.

The third line contains an integer m $(1 \le m \le 10^5)$ — the number of Kuriyama Mirai's questions. Then follow m lines, each line contains three integers $type$, l and r $(1 \le l \le r \le n;\ 1 \le type \le 2)$, describing a question. If $type$ equal to 1, then you should output the answer for the first question, else you should output the answer for the second one.

Output

Print m lines. Each line must contain an integer — the answer to Kuriyama Mirai's question. Print the answers to the questions in the order of input.

Examples

input

```
6
6 4 2 7 2 7
3
2 3 6
1 3 4
1 1 6
```

output

```
24
9
28
```

input

```
4
5 5 2 3
10
1 2 4
2 1 4
1 1 1
2 1 4
2 1 2
1 1 1
1 3 3
1 1 3
1 4 4
1 2 2
```

output

```
10
15
5
15
5
5
2
12
3
5
```

Note

Please note that the answers to the questions may overflow 32-bit integer type.