

QCC P6 - Freedom!

Time limit: 1.0s **Memory limit:** 256M

Finally, COVID-19 has been eradicated! To celebrate, you and your neighbours decide to meet up to have a massive party. You and your neighbours live along a street with N houses numbered 1 to N . Each house is at a height of a_i . The *travel cost* from house x to house y is defined as: $\sum_{k=\min(x,y)}^{\max(x,y)-1} |a_{k+1} - a_k|$ or 0 if $x = y$.

To have a party at house x , everyone must come to house x . The total cost of having the party at house x is the sum of the travel costs of each individual house travelling to house x . However, not everyone on your street is willing to host such a massive party. More specifically, out of you and your neighbours, only Q people are willing to host it. To help determine the best house to have the party, you have compiled all the house numbers into a list h that would be willing to host a party. For each house in h , print out the cost of having a party at h_i .

Input Specification

The first line will contain the positive integer N , the number of houses on your street.

The second line will contain N space-separated positive integers, a_i , the height of the i^{th} house.

The third line will contain the positive integer Q , the number of people willing to host the party.

The next Q lines will contain a positive integer h_i .

Output Specification

For each house number h_i , print out the corresponding cost of hosting a party at h_i .

Constraints

For all subtasks:

$$3 \leq N \leq 10^6$$

$$0 \leq a_i \leq 10^6$$

$$1 \leq Q \leq 10^6$$

$$1 \leq h_i \leq N$$

Subtask 1 [10%]

$$3 \leq N \leq 400$$

$$1 \leq Q \leq 400$$

Subtask 2 [20%]

$$3 \leq N \leq 4 \times 10^3$$

$$1 \leq Q \leq 4 \times 10^3$$

Subtask 3 [70%]

No additional constraints.

Sample Input 1

```
4
1 2 5 1
2
2
4
```

Sample Output 1

```
11
19
```

Sample Input 2

```
8
1 3 2 5 999 0 6 6
5
6
5
4
3
2
```

Sample Output 2

8996

6998

6998

7004

7008