

Increasing Interval Distribution

Description

You are given an array $a_1, a_2, \dots, a_n$. We say an interval $[l, r]$ is an increasing interval iff $a_i = a_{i-1} + 1$ for all $l < i \leq r$. Dreamoon is curious about the increasing interval distribution, so sometimes he will ask you an interval $[l, r]$, and you should answer him how many subinterval of $[l, r]$ are increasing intervals. It sounds easy, but sometimes his lovely sister will change an element in the array :)

Input

The first line contains a integer T indicating the total number of test cases. Each test case starts with a line containing an integer n . Then one line contains n integers $a_1, a_2, \dots, a_n$. Then one line contains an integer m , denoting the number of actions Dreamoon and his sister take. Then each of following m lines contains three integers denoting the events in order. “0 p v” means that the lovely sister change a_p to v , and “1 l r” means Dreamoon ask you an interval $[l, r]$.

- $1 \leq T \leq 20$
- $1 \leq n, m \leq 10^6$
- $1 \leq a_i, v \leq 10^9$
- $1 \leq p \leq n$
- $1 \leq l \leq r \leq n$
- There are at most 3 test cases with $n > 1000$.

Output

For each Dreamoon’s query, output the answer in one line.



Sample Input

```
2
8
1 3 4 5 6 10 11 12
2
1 3 5
1 3 8
3
1 1 1
5
1 1 3
0 2 2
1 1 3
0 3 3
1 1 3
```

Sample Output

```
6
12
3
4
6
```