# F. Fafa and Array

time limit per test: 3 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Fafa has an array $A$ of $n$ positive integers, the function $f(A)$ is defined as $\sum_{i=1}^{n-1} |a_i - a_{i+1}|$. He wants to do $q$ queries of two types:

- $1\ l\ r\ x$ — find the maximum possible value of $f(A)$, if $x$ is to be added to one element in the range $[l,\ r]$. You can choose to which element to add $x$.
- $2\ l\ r\ x$ — increase all the elements in the range $[l,\ r]$ by value $x$.

Note that queries of type $1$ don't affect the array elements.

## Input

The first line contains one integer $n$ $(3 \le n \le 10^5)$ — the length of the array.

The second line contains $n$ positive integers $a_1, a_2, ..., a_n$ $(0 < a_i \le 10^9)$ — the array elements.

The third line contains an integer $q$ $(1 \le q \le 10^5)$ — the number of queries.

Then $q$ lines follow, line $i$ describes the $i$-th query and contains four integers $t_i\ l_i\ r_i\ x_i$ $(t_i \in \{1, 2\},\ 1 < l_i \le r_i < n,\ 0 < x_i \le 10^9)$.

It is guaranteed that at least one of the queries is of type $1$.

## Output

For each query of type $1$, print the answer to the query.

### Examples

**input** Copy

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

**output**

```
2
8
```

**input** Copy

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

**output**

```
6
10
```

Server time: Feb/19/2018 15:56:15UTC-3 (d3).
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