Minimum Multiple

HackerRank

Calculi is Lambda's older brother. Lambda is mischievous and always annoys Calculi by asking silly questions. This time around, Lambda would like to surprise Calculi by asking a challenging and interesting question. To that end, Lambda gives Calculi an array of N integers, $A = \{a_0, a_1, \ldots, a_{N-1}\}$, followed by K queries. Each query is of two types:

- $Q\ l\ r$: Find the minimum positive integer, M, such that each element in subarray $arr[l \ldots r]$ $(\{a_l, a_{l+1}, \ldots, a_r\})$ divides M.
- $U\ idx\ val$: Multiply the value at idx by val. That is $a'_{idx} = a_{idx} \times val$, where a'_{idx} is the updated value.

Your task is to help Calculi tackle this challenge. For each query of type $"Q\ l\ r"$, find the value of M. As this value can be very large, print the M modulo $(10^9 + 7)$, i.e., $M\%(10^9 + 7)$. For query of type $"U\ idx\ val"$, update the required element.

Input Format

The first line contains an integer, N, which represents the length of array, A.
In second line, there are N space-separated integers, $a_0, a_1, \ldots, a_{N-1}$, representing the elements of A.
In third line, there is another integer, K, which is the count of queries to follow.
Then follows K lines, each representing a query of one of the types described above.

Constraints

- $1 \leq N \leq 5 \times 10^4$
- $1 \leq a_i \leq 100$, where $i \in [0, N-1]$
- $1 \leq K \leq 5 \times 10^4$
- $0 \leq l \leq r < N$
- $0 \leq idx < N$
- $1 \leq val \leq 100$

Output Format

For each query of type `Q l r`, print the value of $M\%(10^9 + 7)$ on a new line.

Sample Input

```
5
2 5 6 1 9
7
Q 0 4
U 1 2
Q 0 2
Q 3 4
Q 2 4
```

```
U 3 8
Q 2 3
```

Sample Output

```
90
30
9
18
24
```

Explanation

Query 1 (Q 0 4): Calculi has to find M for (sub)array $A[0 \dots 4] = \{2, 5, 6, 1, 9\}$ which is 90.
Query 2 (U 1 2): $a'_1 = a_1 \times 2 = 10$. Now updated array is $A = \{2, 10, 6, 1, 9\}$.
Query 3 (Q 0 2): M for subarray $A[0 \dots 2] = \{2, 10, 6\}$ is 30.
Query 4 (Q 3 4): M for subarray $A[3 \dots 4] = \{1, 9\}$ is 9.
Query 5 (Q 2 4): M for subarray $A[2 \dots 4] = \{6, 1, 9\}$ is 18.
Query 6 (U 3 8): Updated array is $A = \{2, 10, 6, 8, 9\}$.
Query 7 (Q 2 3): M for subarray $A[2 \dots 3] = \{6, 8\}$ is 24.

Tested by Wanbo