J Maximal Non-Coprime

Given an integer array a of length N ($1 \leq N \leq 10^4$, $1 \leq a_i \leq 10^3$), perform Q queries ($1 \leq Q \leq 10^4$).
Queries will can be in the following formats:

- `C` i v: change the number at index i (0-indexed) to the value v ($1 \leq v \leq 10^3$).
- `F` i j v: find the maximal number k with index between i and j (inclusive) such that $gcd(k, v) \neq 1$. In other words, k is the maximum in $a[i...j]$ such that k shares a factor (other than 1) with v ($1 \leq v \leq 10^3$). If there is no such number, output -1.

Note: There are 168 primes less than 10^3.

SHORT NAME: `max_noncoprime`

INPUT FORMAT:
The first line of input contains N, the length of the array a ($1 \leq N \leq 10^4$).
The second line contains the elements of array a ($1 \leq a_i \leq 10^3$), separated by spaces.
The third line contains the number of queries Q ($1 \leq Q \leq 10^4$).
The fourth through $3 + Q$ lines (inclusive) contain each query. Queries are either of the format `C` i v or `F` i j v ($0 \leq i, j \leq N - 1$, $1 \leq v \leq 10^3$).

OUTPUT FORMAT:
For each query that starts with `F`, output the maximal integer k in $a[i...j]$ such that $gcd(k, v) \neq 1$, or -1 if k does not exist.

SAMPLE INPUT:

```
4
2 3 49 25
6
C 0 10
F 1 2 5
F 0 3 5
C 3 5
F 0 3 5
F 1 3 7
```

SAMPLE OUTPUT:

```
-1
25
10
49
```