Prime queries

You are given a simple task. Given a sequence A[i] with N numbers s.t. 1<=i<=N . You have to perform Q operations on a given set of numbers.

Operations :

1. A V I, Add the value V to element with index I .
2. R a l r, Replace all the elements of sequence with index i s.t. l<=i<=r with a .
3. Q l r, print the Number of elements with index i s.t. l<=i<=r and A[i] is prime number and A[i] <=10^7 .

No Number In sequence ever will exceed 10^9.

Constraints : 1<=N<=10^5, 1<=Q<=10^5, V<=10^3, A[i] <= 10^8 , a<=10^7, 1 <= l <= r <=N.

Input :
First line contains N as Number of sequence elements && Q as number of operations to be performed. Second line contains Initial N elements of the sequence. After that each of the next Q lines contains one operation to be performed on the sequence.

Output :
print each value in newline as stated above.

Example
Input :
5 10
1 2 3 4 5
A 3 1
Q 1 3
R 5 2 4
A 1 1
Q 1 1
Q 1 2
Q 1 4
A 3 5
Q 5 5
Q 1 5

Output :
2
1
2
4
0