Interval of interest

描述

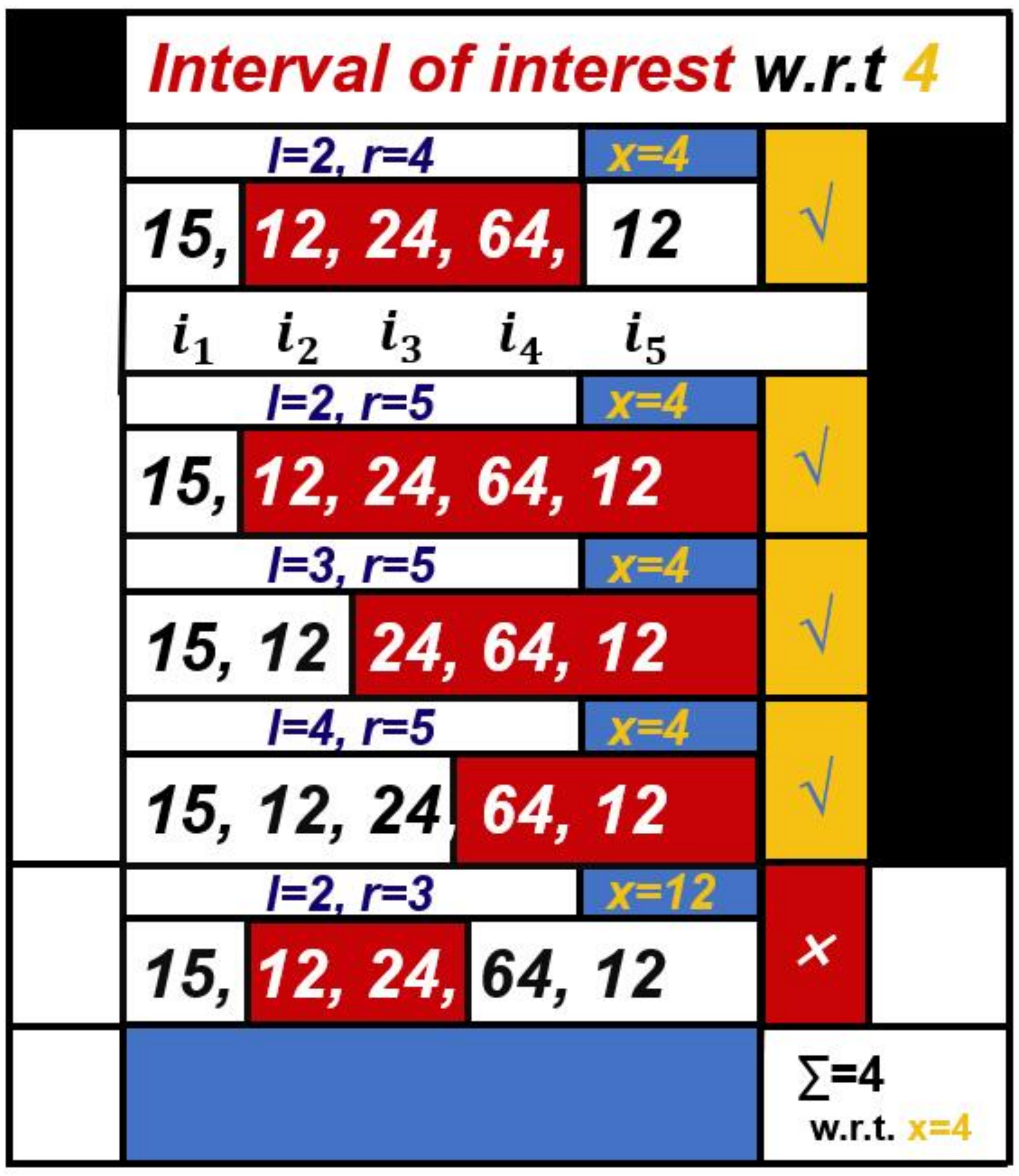
Motivation

A seqence of intergers are given: i_1, i_2, ..., i_n. Define the interval of interest(IOI) with respect to x, parameterized by[l, r] subjected to: gcd(i_l, i_l+1, ..., i_r)=x, where 1<=l<=r<=n.

Gcd here means the greatest common divisor.

Goal

Count all possible intervals with respect to x=x_1, x_2, ..., x_q for the given sequence i_1, i_2, .., i_n.



输入

1. The first line: an integer n, (1 <= n <= 10^5), indicating the length of the given sequence.
2. Next line: n integers separated by space: i_1, i_2, ..., i_n (1<=i_{}<=10^9).
3. The third line: an integer q, (1 <= q <= 3*10^5), indicating the number of xs
4. The forth line: q integers separted by space: x_1, x_2, ..., x_q, (1<=x_{}<=10^9).

输出

For each x, output the number of possible IOIs with respect to x_1, x_2, ...

输入样例 1

```
5
15 12 24 64 12
2
4 12
```

输出样例 1

```
4 3
```

提示

Observation1: gcd(a, b, c) = gcd(gcd(a, b), c)

Observation2: for the sequence i_1, ..., i_n, define the sequence k_1=i_1, k_j=gcd(k_{j-1},i_{j}) for 2<=j<=n. The number of distinct values in k sequence is no more than 1+log_2^{i_1}.

Hint1: Divide & conquer may be useful:

1. count IOIs at left half(by recursion)
2. count IOIs at right half(by recursion)
3. merge and conut intervals that start from the left half and end at right half(how to count efficiently?, hint: observation 2)

Hint2: try to set a AVL tree / hash, count gcd for all x in one time.

Hint3: the solution of nlogn is possible