Distance

In this task let's consider distance between two positive integers defined as below.

Single operation is : multiplying some number by prime number or dividing some number by prime number (we can divide only when remainder is equal to 0)

Distance d between two numbers a,b is minimum number operations to convert one number to another.

For example d(69,42)=3

This distance is very similiar to well-known term "distance" in real human life:

d(a,a)=0 , distance number to itself is 0

d(a,b)=d(b,a) distance from a->b is equal to b->a

d(a,b)+d(b,c)>=d(a,c) triangle equation is true too

With given n number you have to determine for each i-th of those numbers closest number aj from set that

i!=j and if there is many numbers with equal, smallest distance, you have to pick number with smallest index

Input

In first line - number n <=10^5.

In next n lines - i-th number. Every number is not greater than 10^6

Output

You have to output n lines.

I-th line should contain index of closest number (if there is many answers, please output smallest index)

Example

Input:
6
1
2
3
4
5
6
Output:
2
1

1
2
1
2