Fork’s Gcd

Fork has a sequence a1, ..., an. Now Fork performs Q modification operations. Each operation adds an integer d to all numbers in sequence. Fork wants to know the greatest common divisor of all numbers in the current sequence after each modification operation. Can you help him？

Fork considers that the greatest common divisor of any number and 0 is itself, and the greatest common divisor of a negative number is equal to the greatest common divisor of its absolute value.

Input format:

The first line contains two integers n and Q (1 <= n, Q <= 100000)--the length of the sequence and the number of modifications.

The second line contains n separated integers a1, ..., an (-1011 <= ai <= 1011)--the initial sequence.

Next Q lines, each line contains an integer d (-1011 <= d <= 1011), which means that all numbers in the current sequence are added by d.

The output has $ Q $ lines. For each modification operation, an integer is output to indicate the answer.

**input**

4 5

6 3 -3 0

3

2

-9

15

-2

**output**

3

1

1

1

3

样例解释

样例1

Gcd(9,6,0,3)=3

Gcd(11,8,2,5)=1

Gcd(2,-1,-7,-4)=1

Gcd(17,14,8,11)=1

Gcd(15,12,6,9)=3

给定初始数列$a\_1 ,\cdots,a\_n$，执行$Q$次修改操作，每次操对所有数加上一个整数$d$，每次修改操作后输出当前数列所有数的最大公约数。

本题中认为任何数和$0$的最大公约数是其本身，和负数的最大公约数等于与其绝对值的最大公约数。

第一行读入两个整数$n、Q$（$2 \le n,Q \le 100000$），表示数列长度和修改次数。

第二行读入$n$个隔开的整数$a\_1 ,\cdots,a\_n$（$-10^{11} \le a\_i \le 10^{11}$），表示初始的数列。

接下来$Q$行每行输入一个整数$d$（$-10^{11} \le d \le 10^{11}$），表示对当前数列所有数都加$d$。

输出有$Q$行，对于每次修改操作输出一个整数，表示答案。