Problem C. Fraction Factory

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	512 mebibytes

The famous Berland Fraction Factory works with different fractions: it can multiply them, break them into pieces, convert them between number systems.

But today everyone forgets about work, because today is a special day: the official supplier brought an incredibly large fraction to the factory. Here it is:

$$Q = \frac{a_1 \cdot a_2 \cdot \ldots \cdot a_n}{b_1 \cdot b_2 \cdot \ldots \cdot b_m}$$

Employees became interested in Q very quickly. So much that they even decided to calculate its value! Unfortunately for them, they did not have enough computing power. Fortunately for them, today you came to an interview at the Berland Fraction Factory. So now it is your task, and after solving it, you are guaranteed to get a job.

For better accuracy, the employees ask you to calculate the value of Q just modulo M, but repeatedly. More precisely, for $1 \le l \le k$, you have to output Q modulo M_l, where M_l is an integer greater than 1.

Now, let us formalize the process of calculation $Q \bmod M$. First, we factorize (decompose into prime factors) all factors in numerator and denominator of Q. Then we "reduce" all repeating primes: while there exists a prime number p and two positive integers A and B such that $Q = \frac{p \cdot A}{p \cdot B}$, we divide both numerator and denominator by p. After all that, we "fairly" calculate the value of $Q \bmod M$. As usual, we assume that $\frac{1}{x} \bmod M$ equals to such y that $0 \le y < M$ and $x \cdot y \equiv 1$ modulo M. If no such y exists, we say that x is non-invertible.

If during calculations modulo M, you have to invert a non-invertible value, just output "`DIVISION BY ZERO`".

Input

The first line of the input contains two integers n and m ($1 \le n, m \le 5000$): the total number of factors in the numerator and denominator of the fraction, respectively.

The second line contains n integers a_i ($1 \le a_i \le 10^{18}$).

The third line contains m integers b_j ($1 \le b_j \le 10^{18}$).

The next line contains one integer k ($1 \le k \le 50$): the total number of queries.

Each of the following k lines contains an integer M_l ($2 \le M_l \le 10^{18}$).

Output

Print k lines. The l-th line must contain one integer ($Q \bmod M_l$) if it is correctly defined for that l, or the string "`DIVISION BY ZERO`" without quotes otherwise.

Example

standard input	standard output
3 2 8 11 14 9 12 4 8 9 10 11	4 DIVISION BY ZERO 4 0