

Fraction Iteration

Input file: **standard input**
Output file: **standard output**
Time limit: 3 seconds
Memory limit: 1024 megabytes

You are given an irreducible fraction $\frac{a}{b}$ (i.e., $\gcd(a, b) = 1$). Every second, both the numerator and the denominator increase by 1, and then the fraction is immediately reduced to its simplest form.

Formally, if the current fraction is $\frac{a}{b}$, after one second it becomes $\frac{a+1}{b+1}$, then let $g = \gcd(a + 1, b + 1)$, and update it to $\frac{(a+1)/g}{(b+1)/g}$.

Given the initial fraction $\frac{a}{b}$ and q queries, each providing an integer k_i , you need to find the fraction exactly after k_i seconds, starting from the initial state.

Input

There are multiple test cases. The first line of the input contains an integer T ($1 \leq T \leq 10^3$), indicating the number of test cases. For each test case:

The first line contains three integers a , b , and q ($1 \leq a, b \leq 10^{12}$, $1 \leq q \leq 100$). It is guaranteed that $\gcd(a, b) = 1$ initially.

For the following q lines, the i -th line contains an integer k_i ($1 \leq k_i \leq 10^{18}$), indicating the time of the query.

Output

For each query, output one line containing two integers a' and b' separated by a space, indicating the numerator and denominator of the fraction exactly after k_i seconds, starting from the initial state.

Example

| standard input | standard output |
|----------------|-----------------|
| 3 | 1 4 |
| 1 7 3 | 2 5 |
| 1 | 1 2 |
| 2 | 1 1 |
| 3 | 5 4 |
| 1 1 1 | 8 3 |
| 1 | 8 7 |
| 13 3 3 | |
| 7 | |
| 2 | |
| 10 | |