E. Geometric Progressions

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Geometric progression with the first element a and common ratio b is a sequence of numbers $a, ab, ab^2, ab^3, ...$

You are given n integer geometric progressions. Your task is to find the smallest integer x, that is the element of all the given progressions, or else state that such integer does not exist.

Input

The first line contains integer $(1 \le n \le 100)$ — the number of geometric progressions.

Next n lines contain pairs of integers a, b $(1 \le a, b \le 10^9)$, that are the first element and the common ratio of the corresponding geometric progression.

Output

If the intersection of all progressions is empty, then print -1, otherwise print the remainder of the minimal positive integer number belonging to all progressions modulo 1000000007 $(10^9 + 7)$.

Examples

input
2 2 2 4 1
output
4

input
2 2 2 3 3
output
-1

Note

In the second sample test one of the progressions contains only powers of two, the other one contains only powers of three.