HackerRank

Project Euler #243: Resilience

This problem is a programming version of Problem 243 from projecteuler.net

A positive fraction whose numerator is less than its denominator is called a proper fraction. For any denominator d, there will be d-1 proper fractions.

We shall call a fraction that cannot be cancelled down a resilient fraction. Furthermore we shall define the resilience of a denominator R(d) to be the ratio of its proper fractions that are resilient.

For example, for d = 12: 1/12, 5/12, 7/12, 11/12 are the resilient fractions.

Therefore, R(12)=4/11

In fact, d=12 is the smallest denominator having a resilience R(d) < 4/10

Given pairs of integers a_i, b_i , representing numerator and denominator of a proper fraction q_i , find the smallest denominator d, having resilience $R(d) < q_i$

Input Format

The first line of each test file contains a single integer T. Next T lines each contain a pair of integers a_i , b_i , separated by a single space, representing q_i .

Constraints

- $1 \leq T \leq 50000$
- $1 \leq a_i < b_i \leq 100000$
- $q_i \geq 1/10$

Output Format

For each q_i print the answer on a separate line.

Sample Input 0

1 4 10

Sample Output 0

12

Explanation 0

See problem description