謝旻錚教授競技程… (/groups/11/)

蔡錫鈞教授演算法… (/groups/19/)

蔡錫鈞教授演算法… (/groups/25/)

991 . Assignment 7 - Enumerating Game (Deadline: 2019-10-19 23:59:59)

Submit (/submissions/new/?problem_id=991)

Submissions (/groups/25/submissions/?problem_id=991)

Back to List (/groups/25/problems/)

Description

You're given an infinite binary tree, each node of which consists of a pair of ordered positive integers, i.e., the order of the integers matters.
The node associated with a pair of positive integers (i, j) has two children: the ordered pair $(i, i + j)$ is for the left child, and $(i + j, j)$ is for the right child.
The root of the binary tree is the first node which has a pair of positive integers (a, b) and an order of 1.
The nodes of the binary tree are enumerated from the root and level-by-level from left to right, just as the ordering in a binary heap; that is, if the node in the binary tree has an order of x, then the order of its left and right child is $2x$ and $2x + 1$, respectively.

Given a pair of positive integers (c, d), find its order in the binary tree.

Input Format

The first line of the input contains an integer M, indicating the number of test cases. Each test case consists of one line with four space-separated positive integers a, b, c and d.

- $1 \leq M \leq 10$
- $1 \leq a, b < 10$
- $1 \leq c, d < 10^6$

Output Format

For each test case, output the order of (c, d) in the binary tree, or -1 if (c, d) does not appear in the tree.
As the number can be quite large, output it **modulo** 524287.