Problem C: Generating Generations

Filename: `c`
Time Limit: `1 second`

Frogs are pretty neat. They capture food by shooting their tongue out in a flipping motion, and latching onto prey. Because of this, it is advantageous for a species of frog to have a longer tongue so that they can capture prey more easily.

Red Tree Frogs have known about this advantage for a long time, and have prepared their evolution appropriately over the last few decades. However, other species of frogs are a little bit behind on the evolutionary learning curve.

For every new generation of this species of frog, the tongues get longer. Specifically, if a particular generation of this species has a tongue length of **L**, then we know that the next generation will have a tongue length of exactly 2**L** + 1.

It can be shown that given infinite time, a species of frog will eventually have an infinitely long tongue. This is why it is so important for generations of frogs to continue generating new generations of frogs!

A species of frog has come to you to ask for your help. They wonder, at their current generations' tongue length **x**, for some target tongue length **y**, what is the minimum number of generations needed until the species' tongue length is at least **y**?

Problem

For a starting tongue length **x** and target tongue length **y**, compute the number of generational generations until the tongue length of the species is at least **y**.

Input

The first line of input contains a single positive integer, **s**, representing the number of species you are asked to consider.

Each test case will contain one line with two positive integers **x**, representing the current tongue length of this generation, and **y**, the target tongue length of the species.

Output

For each species, print the number of generations until they reach their target tongue length. If their current tongue length is already at least **y**, print `0`.

Input Bounds and Corresponding Credit

- $1 \leq \mathbf{s} \leq 10^4$
- $1 \leq \mathbf{x}, \mathbf{y} \leq 10^6$

Samples

Input	Output
4 3 12 4 4 10 9 5 11	2 0 0 1