Guess

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

Alice and Bob are playing a game. Each of them has a card on his/her forehead with a positive integer written on it(Alice has the integer a and Bob has the integer b).

Alice and Bob can only see their opponent's number, but both of them know that the two numbers a, b are positive integers and one is twice as large as the other.

Each round, Alice and Bob try to guess their own number in turn, Alice first. (Each round ends when both Alice and Bob finish their tries.)

Both of them are smart enough and they won't make mistakes. They will speak out the answer if and only if they exactly know it, otherwise, they will say "I don't know"instead.

Given the two numbers on Alice's and Bob's foreheads, find out which round one of them can speak out the integer on his/her forehead.

Input

This problem contains multiple test cases.

The first line contains an integer T indicating the number of test cases ($1 \leq T \leq 10^5$).

For each test case, the only line contains two integers a, b ($1 \leq a, b \leq 10^{18}$).

It is guaranteed that $a = 2b$ or $b = 2a$ always holds.

Output

For each test case, output two integers r, p indicating at the r-th round, p can speak out the answer. $p = 0$ stands for Alice and $p = 1$ stands for Bob.

Example

standard input	standard output
3 6 3 1 2 499999999999999999 999999999999999998	1 0 1 1 1 1

Note

For the first sample, Alice can see the number on Bob's forehead, which is an odd number 3. Then she can find out that the number on her forehead must be 6 because there is no integer x such that $3 = 2x$.

Please notice that: The range of a, b is just for you while the two players don't know it. That is, when $a = 5 \times 10^{17}, b = 10^{18}$, Alice can't speak out her number immediately even if $a = 2 \times 10^{18}$ is out of input range.