Goat Simulation

Description

S..Sorry, did I say Goat Simulation? Come on, who in the world will like to act as a boring goat in computer games? I would actually like to introduce you a more interesting game - the **Genius Simulation**!

Shik and Fcrh are the most intelligent guys ever. (No, Shik is not crazy. He is just crazy **about stonehenges**.) One day, they play a game described as follows: At the beginning, you, as the judge of the game, choose two positive integers a and b secretly, $1 \leq a \leq b$. You then tell Shik the value of $a + b$, and tell Fcrh the value of $a \times b$.

Then the game goes multiple rounds. In each round, Shik and Fcrh should either **claim** or **keep silent** to each other, simultaneously. If a person claims, it means that he has deduced the values of a and b based on his given number and results of previous rounds. On the other hand, if he does not know the values of a and b so far, then he should keep silent in this round. As we have mentioned, Shik and Fcrh is incredibly smart. Therefore, they will play as well as possible.

The game actually continues perpetually. (They are still playing just now) You have left before they start the first round because you have an important programming competition. However, you are curious about the result of the game. So you decide to simulate these two geniuses, by writing a program!

Input

The first line contains an integer T indicating the total number of test cases. Each test case only contains two integers a, b, $1 \leq a \leq b$, in a line.

- $T = 1275$
- You pretty sure that you did not write any number bigger than 50, i.e., $a, b \leq 50$. This constraint is not guaranteed to Shik and Fcrh, so it will not be used in their deduction. For example, if Shik receives 100 as the value of $a + b$, he cannot claim at the first round directly.

Output

Obviously, if a person has claimed in a round, the he must claim in future rounds as well. For each test case, output two numbers as the earliest round that Shik and Fcrh claims, respectively. If a person keeps silent forever, output his corresponding number as -1.

Sample Input

```
3
1 1
2 2
1 11
```

Sample Output

```
1 1
2 3
2 1
```