# Problem J. Xingqiu's Joke

Once again, Xingqiu hides Chongyun's ice cream into a box with a strange lock. Liyue's summer has been always very hot and Chongyun suffers more because of his excessive yang (positive) energy, so he needs that ice cream desperately.



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There are two integers $a$ and $b$ on the lock. Chongyun can perform the following three types of operations any number of times:

- Minus 1 from both $a$ and $b$;

- Plus 1 to both $a$ and $b$;

- Divide both $a$ and $b$ by one of their common **prime** factor (that is to say, divide them by a **prime** $g$ where $a$ and $b$ are both divisible by $g$).

The box will be unlocked if either $a$ or $b$ or both become 1. To help Chongyun gets the ice cream back as quickly as possible, please tell him the minimum number of operations needed to unlock the box.

## Input

There are multiple test cases. The first line of the input contains an integer $T$ ($1 \le T \le 300$) indicating the number of test cases. For each test case:

The first and only line contains two integers $a$ and $b$ ($1 \le a, b \le 10^9$, $a \ne b$).

## Output

For each test case output one line containing one integer indicating the minimum number of operations to make $a$ or $b$ or both equal 1.

## Example

| standard input | standard output |
|---|---|
| 5<br>4 7<br>9 8<br>32 84<br>11 35<br>2 1 | 2<br>7<br>5<br>4<br>0 |

## Note

For the first sample test case, the optimal way is $(4, 7) \rightarrow (3, 6) \rightarrow (1, 2)$.

For the second sample test case, the optimal way is to apply the first type of operation 7 times.

For the third sample test case, the optimal way is $(32, 84) \rightarrow (16, 42) \rightarrow (15, 41) \rightarrow (14, 40) \rightarrow (13, 39) \rightarrow (1, 3)$.

For the fourth sample test case, the optimal way is $(11, 35) \rightarrow (12, 36) \rightarrow (6, 18) \rightarrow (2, 6) \rightarrow (1, 3)$.