Welcome to the world of mice. All mice have IDs. They are numbered orderly according to their seniority from 1. These mice live in groups. Mice of a same group have continuous ids. Mini, the mice captain (ID 0) has called mice of specific group(IDs a to b) for a session. He wanted to make a circle formation with those mice.

But mice have a property: The Degree of quarrel. When 2 mice are near they quarrel to an extent that is proportional to the difference in the number of factors of their individual ids. For example when 2 mice of ids 4 and 24 are near they quarrel 5 units(say). Number of factors of 4 — 3(1,2,4). 24 — 8 (1,2,3,4,6,8,12,24).

Also the strength of quarrel affects the neighbourhood. So, Mini, the mice captain wants to minimize the strength of the maximum quarrel in that circle by arranging the mice appropriately. Note that the circle formation is mandatory. Help Mini, the mice caption to MiniMice the quarrel.

Input

First line contains number of test cases.

Each test case is represented by a space separated list of 2 ids representing the group of mice 'a b'. All mice with ids $a \leq id \leq b$ are present in the session. $1 \leq a \leq 4999999$; $a < b \leq 5000000$.

Output

Output one line for each test case, the minimized maximum quarrel value. Quarrel value between 2 mice = Absolute Difference in Number of factors of their IDs.

Explanation:

Case 1:

ID - No. of factors
5 - 2
6 - 4
7 - 2
8 - 4
5-6-7-8-5 is a good arrangement. 4-2 = 2.

Case 2:

ID - No. of factors
21 - 4
22 - 4
23 - 2
24 - 8
24-21-23-22-24 is a good arrangement. 8-4 = 4.

Sample Input

```
2
5 8
21 24
```

Sample Output

```
2
4
```