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Time Limit: 2.5 sec / Memory Limit: 1024 MiB

Score : 400 points

Problem Statement

For positive integers x and y , define $f(x, y)$ as follows:

- Let z be the string obtained by interpreting x, y in decimal notation as strings and concatenating them in this order. Let $f(x, y)$ be the value when z is interpreted as an integer in decimal notation.

For example, $f(3, 14) = 314$, $f(100, 3) = 1003$.

You are given positive integers C and D . Find the number of integers x that satisfy the following conditions:

- $1 \leq x \leq D$
- $f(C, C + x)$ is a perfect square.

You are given T test cases, find the answer for each of them.

Constraints

- $1 \leq T \leq 3 \times 10^5$
- $1 \leq C \leq 2 \times 10^8$
- $1 \leq D \leq 5 \times 10^9$
- All input values are integers.

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Input

The input is given from Standard Input in the following format:

```
T
case1
case2
⋮
caseT
```

case_{*i*} represents the *i*-th test case. Each test case is given in the following format:

```
C D
```

Output

Output *T* lines. The *i*-th line ($1 \leq i \leq T$) should contain the answer to the *i*-th test case.

Sample Input 1

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```
4
4 80
183 5000
18 10
824 5000000000
```

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Sample Output 1

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```
3
2
0
1421
```

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For the first test case, there are three values of x that satisfy the conditions: $x = 5, 37, 80$.

- When $x = 5$, $f(C, C + 5) = f(4, 9) = 49 = 7^2$
- When $x = 37$, $f(C, C + 37) = f(4, 41) = 441 = 21^2$
- When $x = 80$, $f(C, C + 80) = f(4, 84) = 484 = 22^2$

For the second test case, there are two values of x that satisfy the conditions: $x = 1, 3133$.

- When $x = 1$, $f(C, C + 1) = f(183, 184) = 183184 = 428^2$
- When $x = 3133$, $f(C, C + 3133) = f(183, 3316) = 1833316 = 1354^2$

For the third test case, there are zero values of x that satisfy the conditions.

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For the fourth test case, there are 1421 values of x that satisfy the conditions.

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