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D - 183184

Time Limit: 2.5 sec / Memory Limit: 1024 MiB

Until 2025-10-18(Sat) 22:10 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20251018T2310&p1=248>), posting problem content, impressions, or solution approaches on social media is prohibited by the rules (/contests/abc428/rules).

禁止在正在进行的 AtCoder 比赛中使用生成式 AI。请参考下面的规则了解详情。

AtCoder 对于生成式 AI 的规定 - 20251003 版本 (<https://info.atcoder.jp/entry/l1m-rules-en>)

注意此规则已于 2025 年 10 月 3 日更新。详情请见[这篇文章](https://atcoder.jp/posts/1568) (<https://atcoder.jp/posts/1568>)。

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.



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

Copy

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

Copy

Sample Output 1

Copy

```
3  
2  
0  
1421
```

Copy

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.

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

```
C++ 20 (gcc 12.2)
```



```
1
```

Remaining Time
01:09:19

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