

# Interesting Integers

## Problem

Let us call an integer *interesting* if the product of its digits is [divisible](#) by the sum of its digits. You are given two integers **A** and **B**. Find the number of interesting integers between **A** and **B** (both inclusive).

## Input

The first line of the input gives the number of test cases, **T**. **T** lines follow.

Each line represents a test case and contains two integers: **A** and **B**.

## Output

For each test case, output one line containing `Case #x: y`, where  $x$  is the test case number (starting from 1) and  $y$  is the number of interesting integers between **A** and **B** (inclusive).

## Limits

Time limit: 20 seconds.

Memory limit: 1 GB.

$1 \leq T \leq 100$ .

### Test Set 1

$1 \leq A \leq B \leq 10^5$ .

### Test Set 2

$1 \leq A \leq B \leq 10^{12}$ .

## Sample

### Sample Input

```
4
1 9
91 99
451 460
501 1000
```

### Sample Output

```
Case #1: 9
Case #2: 0
Case #3: 5
Case #4: 176
```

In Sample Case #1, since the product and the sum of digits are the same for single-digit integers, all integers between 1 and 9 are interesting.

In Sample Case #2, there are no interesting integers between 91 and 99.

In Sample Case #3, there are five interesting integers between 451 and 460:

1. 451 (product of its digits is  $4 \times 5 \times 1 = 20$ , sum of its digits is  $4 + 5 + 1 = 10$ ).
2. 453 (product of its digits is  $4 \times 5 \times 3 = 60$ , sum of its digits is  $4 + 5 + 3 = 12$ ).
3. 456 (product of its digits is  $4 \times 5 \times 6 = 120$ , sum of its digits is  $4 + 5 + 6 = 15$ ).
4. 459 (product of its digits is  $4 \times 5 \times 9 = 180$ , sum of its digits is  $4 + 5 + 9 = 18$ ).
5. 460 (product of its digits is  $4 \times 6 \times 0 = 0$ , sum of its digits is  $4 + 6 + 0 = 10$ ).