

Submissions

Text Messaging Outrage

5pt	Not attempted 2204/2255 users correct (98%)
10pt	Not attempted 1402/2194 users correct (64%)

Ugly Numbers

10pt	Not attempted 554/1040 users correct (53%)
25pt	Not attempted 82/318 users correct (26%)

Increasing Speed Limits

15pt	Not attempted 398/716 users correct (56%)
35pt	Not attempted 49/312 users correct (16%)

Top Scores

austrin	100
Baltazar	100
vepifanov	100
elizarov	100
xhl.kogitsune	100
ivan.popelyshev	100
SergeyRogulenko	100
Vasyl	100
slex	100
frankyym	100

Problem B. Ugly Numbers

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the [Quick-Start Guide](#) to get started.

Small input  
10 points

Solve B-small

Large input  
25 points

Solve B-large

Problem

Once upon a time in a strange situation, people called a number *ugly* if it was divisible by any of the one-digit primes (2, 3, 5 or 7). Thus, 14 is ugly, but 13 is fine. 39 is ugly, but 121 is not. Note that 0 is ugly. Also note that negative numbers can also be ugly; -14 and -39 are examples of such numbers.

One day on your free time, you are gazing at a string of digits, something like:

123456

You are amused by how many possibilities there are if you are allowed to insert *plus* or *minus* signs between the digits. For example you can make

1 + 234 - 5 + 6 = 236

which is ugly. Or

123 + 4 - 56 = 71

which is not ugly.

It is easy to count the number of different ways you can play with the digits: Between each two adjacent digits you may choose put a plus sign, a minus sign, or nothing. Therefore, if you start with D digits there are  $3^{D-1}$  expressions you can make.

Note that it is fine to have leading zeros for a number. If the string is "01023", then "01023", "0+1-02+3" and "01-023" are legal expressions.

Your task is simple: Among the  $3^{D-1}$  expressions, count how many of them evaluate to an ugly number.

Input

The first line of the input file contains the number of cases, **N**. Each test case will be a single line containing a non-empty string of decimal digits.

Output

For each test case, you should output a line

Case #X: Y

where **X** is the case number, starting from 1, and **Y** is the number of expressions that evaluate to an ugly number.

Limits

0 <= **N** <= 100.

The string in each test case will be non-empty and will contain only characters '0' through '9'.

Small dataset

Each string is no more than 13 characters long.

Large dataset

Each string is no more than 40 characters long.

Sample

Input      Output

```
4      Case #1: 0
1      Case #2: 1
9      Case #3: 6
011    Case #4: 64
12345
```

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