

Numeric Palindromes

A numeric palindrome is a number that reads the same forwards or backwards. For example, 747, 1221, and 555 are all numeric palindromes. By following a simple process, most numbers can be converted into palindromes.

The process is to take the original number, reverse the digits and add the two resulting numbers. For example, if the original number is 49, the reversed digit number is 94. If we add 49 and 94, the result is 143. This is not a palindrome yet, so we repeat, by reversing 143 to get 341, and adding. 143 plus 341 gives us 484. Shazam! We have a palindrome.

Some numbers require only one cycle of reverse and add. Others require 10, 20, or even more cycles.

Your program will be required to find the palindromes for a set of numbers. For each number, it will need to calculate the number of cycles and the resulting numeric palindrome.

The input file will contain multiple lines. The first line will contain a single number. This is the number of problems in the file. Each subsequent line will contain a number, N. N is the starting number. The program will calculate the palindrome, P, and the number of cycles required to find P. The numbers N and P will obey the constraint $0 < N \leq P < 1,000,000,000$. After the first line, each line in the input file will produce a line in the output file with two numbers, the number of cycles to find P, and the value of P, separated by a single space.

Example

input.txt

```
4$  
1$  
49$  
69$  
86$
```

output.txt

```
0 1$  
2 484$  
4 4884$  
3 1111$
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