AMERICAN COMPUTER SCIENCE LEAGUE

2001 - 2002 **Contest #3**

Intermediate Division Programming Problem

PALINDROME

PROBLEM: A positive integer is said to be a palindrome with respect to base b, if its representation in base b reads the same from left to right as from right to left. Palindromes are formed as follows:

Given a number, reverse its digits and add the resulting number to the original number. If the result isn't a palindrome, repeat the process. For example, start with 87 base 10. Applying this process, we obtain:

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87 + 78 = 165
       165 + 561 = 726
              726 + 627 = 1353
                     1353 + 3531 = 4884, a palindrome
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Whether all numbers eventually become a palindrome under this process is unproved, but all base 10 numbers less than 10,000 have been tested. Every one becomes a palindrome in a relatively small number of steps (of the 900 3-digit numbers, 90 are palindromes to start with and 735 of the remainder take fewer than 5 reversals and additions to yield a palindrome). Except, that is, for 196. Although no proof exists that it will not produce a palindrome, this number has been carried through to produce a 2 million-digit number without producing a palindrome.

INPUT: Five sets of data. Each set will consist of a positive integer and its base. Bases will be in the range 2 – 10.

OUTPUT: Print the palindrome produced. If no palindrome is produced after 10 additions, print the word “none” and the last sum.

SAMPLE INPUT	**SAMPLE OUTPUT**
1. 87, 10	1. 4884
2. 1211, 3	2. 112211
3. 3112 ,4	3. 233332
4. 196, 10	4. NONE, 18211171