CS2002301 & EC2002302 Data Structures

Homework #0

Due date: 10/05/2020 10:20

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Announcements

1. This assignment is weighed 5 points.
2. Please submit your code to online judge system (http://nlp.csie.ntust.edu.tw:2020/).
3. Additionally, submit a report and source code to the Moodle system. In the report, briefly explain your code and how do you solve the problem.

(5 pts) Symmetric Numbers

Some numbers still read the same after you rotate the number upside down, we called those numbers "symmetric numbers". For example, "69" and "11" are symmetric numbers, because they read the same after rotating. However, "691" is NOT symmetric, because it reads "169" after rotating.

Your program will read a positive integer N, which means the number of digits. Please output all symmetric numbers that contain N digits.

Here we list symmetric numbers with $N = 1$ and $N = 2$:
$N = 1$: 0, 1, 8
$N = 2$: 11, 69, 88, 96

We recommend you to write all symmetric numbers with $N = 3$, note that:

1. There will have 12 symmetric numbers with 3 digits.
2. Numbers start with 0 (ex. 00, 010, 080) are NOT symmetric numbers.
3. The relationships between those numbers and symmetric numbers with $N = 1$ and $N = 2$ can help you to finalise the homework.

Please use recursion to solve this problem.

Hint: The order of numbers doesn't matter, OJ system will handle different order of numbers.