Introduction to Data Structures

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Homework 1B

- 40 points for coding evaluation
  - Submission format
    - File name: yourid_HW1B.c
      - Example: 2000123456_HW1B.c
    - File type: .c (NOT .cpp)
  - Submission site: https://icampus.skku.edu
    - Week 2: [Homework] 1B (code)

- 1 point for report
  - The report is not evaluated in detail but evaluated as Pass/Fail
  - Template: Homework Report Template.docx
  - Submission format
    - File name: yourid_HW1B.pdf
      - Example: 2000123456_HW1B.pdf
    - File type: .pdf
  - Submission site: https://icampus.skku.edu
    - Week 2: [Homework] 1B (report)

- Due date
  - 9/22 23:59 -> 9/27 23:59 (no late submission accepted)

Rules for homework

- You should follow instructions.
  - Complier
    - You will get no/less point if your program cannot be complied with the specified complier
  - Input/output format
    - You will get no/less point if TA's automatic evaluation program cannot parse your input or output.
  - Permitted modification scope
    - You will get no/less point if you modify code outside of the permitted modification scope
  - All other rules
    - You will get severe penalty or no/less point if you violate the given rules.

Complier and input/output rules for homework

- Every implementation homework will be evaluated by TA’s automatic evaluation program with the following complier.
    - Complier: GCC 7.X, 8.X, 9.X or 10.X
        - https://gcc.gnu.org/
    - You will get no/less point if your program cannot be complied with GCC 7.X, 8.X, 9.X or 10.X.
        - For example, do not rely on visual studio.
    - You can use standard library such as *stdlib.h* and *math.h*.

- Input/output format
    - You will get no/less point if TA’s automatic evaluation program cannot parse your input or output according to the following rules.
    - Use `stdin` and `stdout`

Problem

- Problem: 4-ary number
  - In a 4-ary number, each digit has the number 0, 1, 2, or 3.
  - Given the number of digits N (1~6) and the sum of all digits X (0~18), print all the 4-ary number that satisfies the following conditions.
    - The number of digit is N; and
    - The sum of all digits are equal to ~~or larger than~~ X.
  - You should print the numbers in an ascending order.
  - You should use recursion as a main part of the solution.
  - Each line of output should have N-digit numbers.
    - For example, if N=3, you should print “001” instead of “1”.
  - The order of printed numbers should be sorted in ascending order.
  - If there is no number that satisfies the condition, you should print nothing.

Input/Ouput

- Sample1 (N=2, X=3)

input

```
2
3
```

output

```
03
12
21
30
```

- Sample 2 (N=4, X=10)

input

```
4
10
```

output

```
1333
2233
2323
2332
3133
3223
3232
3313
3322
3331
```

Evaluation

- Evaluation
  - TA will test several cases.
  - For each test case,
    - If your C code has a recursive function that mainly solves the problem and the result is printed within 10 seconds on a platform with average computing power,
      - If your output is perfect in terms of the values and the order,
        - You get 100%.
      - Else if your output is perfect in terms of the values only (not the order),
        - You get 70%.
      - Else if your output contains any wrong values,
        - You get 0%.
      - Else
        - You get 70% * (# of your values) / (# of the values for the perfect answer).
    - Else,
      - You get 0%.