Introduction to Computers and Programming

Homework 6

2023/10/24

1. Deadline

You have one week to complete the homework. Hand in your homework via E3 before 2023/10/31 23:55. Please finish your homework as soon as possible. In addition, make sure that your code can be executed on Visual Studio Community 2019.

2. Problems

2.1 Permutation and combination

This is a permutation and combination problem, the mathematical formula $\mathbf{C}_{\mathbf{k}}^{\mathbf{n}}$ of n means there are **n** numbers, and **k** means from the **n** numbers to take **k** numbers out, and this problem is to list all the combinations of $\mathbf{C}_{\mathbf{k}}^{\mathbf{n}}$, and from small rows to big!

Given two integer **n** and **k**, prints all the sequences of length **k** composed of numbers **1,2...n**.

Description

Input

The line contains two integers N ($1 \leq N \leq 9$) and K ($1 \leq K \leq N$), N represents the number 1~N, and K represents the length of the sequence to be output.

Output

Print out all sequences of length k line by line, and the sequence must be in sorted order. The numbers in sequence cannot be repeated.

Example 1:

Input

4 1

Output

1
2
3
4

Example 2:

5 3

Output

123
124
125

134
135
145
234
235
245
345

Example 3:

4 3

Output

123
124
134
234

2.2 Trick Or Treat

Halloween is coming, Tom is looking forward to ask for candy on the street, but there is a strange rule formed by the families on this street: "**when you ask for candies from two consecutive house, the people in this street will think you are greedy, thus, they'll take all of your candies back**".

Tom asked other friends who had been on the street to ask for candy, and learned the amount of candy that every family on the street would give. Please write a program to help him calculate the **maximum number** of candies he can get.

Description

Input

First line contains an integer N ($1 \leq N \leq 40$), indicated how many families on the street. Second line contains N integers and separated by space, indicated the amount of candy T_i in each family ($1 \leq T_i \leq 8$).

Output

Please print out the **maximum** number of candies that can be obtained. The end of each line of output result must be followed by a newline.

Example 1:

Input

6
6 3 8 8 2 8

Output

22

Example 2:

Input

9
2 8 2 8 2 4 6 6 7

Output

29

3. Submission format

Your submission should follow the format below, or you might get some penalty for the wrong format.

- xxxxxxxxx_hw_w07.zip
  - xxxxxxxxx_hw_01.cpp
  - xxxxxxxxx_hw_02.cpp

xxxxxxxxx is your student ID

4. Reminders

Please use recursive function to write homework. If you use non-recursive function to write homework, no points will be awarded. Remember to check the filename before handing in the homework.

5. References

https://en.wikipedia.org/wiki/Euclidean_algorithm