HW9

注意！

- 這一次的作業要讓大家練習使用遞迴
- 我們這邊的改作業的時候會判斷是否有使用 recursive，請同學**不要改掉已經寫好的 function 名稱以及格式**，否則會導致該題0分！
- 這次的作業網路上都找得到答案，同學當然可以參考網路上的code，但希望同學看完code之後可以寫一份自己的答案
- 若有跟別人一模一樣的code一樣算作弊該題0分！

hw9a

Please implement **sum 1~N by using recursive**. You can assume the result of the sum won't overflow.

Input :

Positive *integer* N

Output :

1+2+3+…+N

hw9b

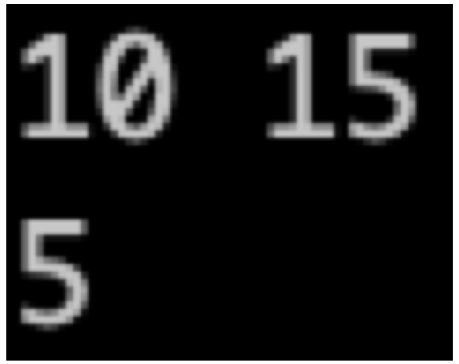
Please find **GCD** (最大公因數) of two positive integers **by using recursive.**

Input :

Two *integers*

Output :

GCD of the integers you've entered



hw9c

Please implement **Binary search** by using recursive.

Input :

The first input is the length of your sequence, assume it is smaller than 100. Then enter a non-identical-*integer* sequence. Finally, enter an integer you are looking for.

Output :

Print the index (ascending order) of the number if it is in the sequence. Otherwise, print -1.

Index starts from 0!

Hint :

If you don't know what Binary search is, the following link has explicit explanation :

https://blog.techbridge.cc/2016/09/24/binary-search-introduction/

```
5
-2 -3 0 -1 1
-4
-1
```

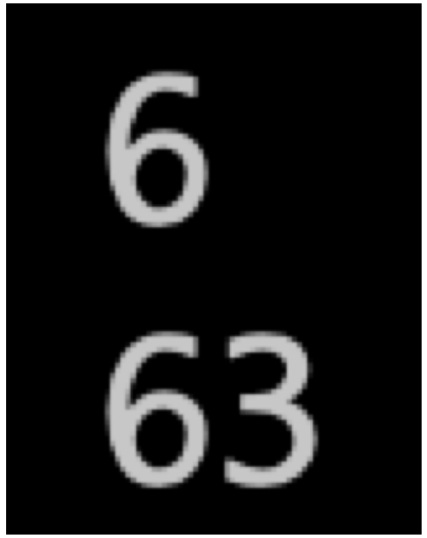
```
5
-2 -3 0 -1 1
0
3
```

hw9d

Please implement **Hanoi Tower** by using recursive.

Input :
The number of disks, you can assume it is a positive integer

Output :
How many times you have moved the disks



Hint :
Algorithm of Hanoi Tower :
https://www.youtube.com/watch?v=5_6nsViVM00

hw9e

Please implement **Permutation** by using recursive.

Input :

A sequence of *char*, you can assume there are no identical letters.

The length of input sequence is <= 9.

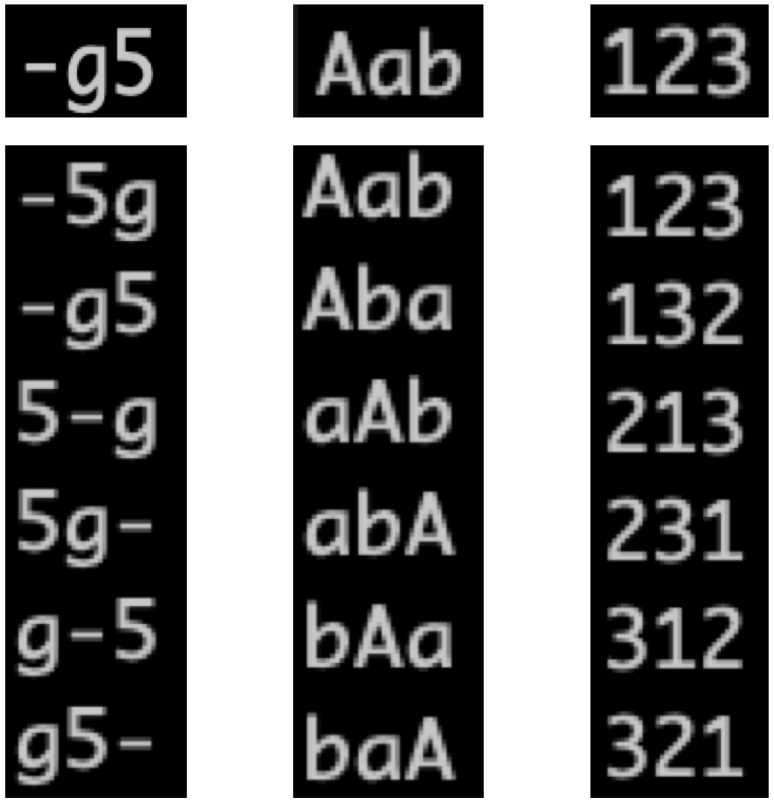
Output :

Every result after permutation. Please output the result in lexicographical order. (compare them in ACSII code)

Hint :

Algorithm of permutation

https://www.youtube.com/watch?v=nYFd7VHKyWQ



hw9f

Please implement **N Queen Problem** (Click me for definition) by using recursive.

Input :
A *positive integer* : **N**, you can assume N<=14
Which represents : **N** Queens on a **N*N** chessboard

Output :
Number of distinct solutions you can place N queens on a N*N chessboard

Hint :
Timeout is 30 sec, it is fine if your code is not so efficient.