Problem 1. N-Bonacci Sequence

Fibonacci Sequence is the series of numbers whose next number is the sum of two numbers before it. We will tweak this a little. In this problem, you will make a N-Bonacci Sequence based on the input N given to you. In N-Bonacci Sequence, the next number is found by the sum of N numbers before it. Then, you need to find the integer in the given index of your sequence.

For example, the 3-Bonacci Sequence goes like 1, 1, 1, 3, 5, 9, 17… and 17 is in the index of 7.

Problem 2. DNA Base Pairing

Our DNA is in the double-helix structure of two strands. Each strand is made up of four bases: A (adenine), T (thymine), C (cytosine), and G (guanine). However, A could be only paired with T, vice versa, and C can only be paired with G. What you will do in this problem is to find where the wrong pair exists, in the given pair of strands.

For example, if Strand 1 : ATCGCCT and Strand 2 : TAGCAGA, you should return 5, since at the 5th index, there's a wrong pair of C and A. Moreover, if there's no wrong pair, you must return 0. (Hint: There's only one wrong pair in the sequence and two strands have the same length.)

Problem 3. Palindrome

A palindrome is the integer which is the same backwards as forwards. To give you an example, 1001 is a palindrome since it is still 1001 backwards. However, 104 is not, because it becomes 401 when it's flipped. Now, you should find the maximum value in the set of palindromes smaller than the given integer. Moreover, there's no palindrome if the input is smaller than or equal to 0, so you must return **Error** when the input is smaller than or equal to 0.

Problem 4. Caesar Code

Caesar Code is the method of encryption which shifts the character by a certain number. For example, if the word CAT is returned as ECS, then it is the Caesar Code with the shift of 2. You must find the value of shift with given sample word and output, then apply the same encryption to the actual input word. (Hint: All characters are capitalized. Also, if there's a shift that goes over Z, it returns to A.)