C++ Recursion Lab 'B' 31-12-2022

1.	*Hailstone series:* *A* Hailstone series *is defined as follows: start with any integer value greater than 0, say x. If x is even, then the next value in the series is x/2; if x is odd, then the next value in the series is 3x + 1. Now apply the same rules to create the next value in the series, and so on. The name Hailstone comes from the property that the values in such a series alternate between going up and down (up for odd values and down for even values.)* For instance, here is the Hailstone series generated from starting value 17: 17, 52, 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, 1 Note that if a Hailstone series ever reaches the value 1, then the next value generated is 4, the next is 2, and the next is 1 again. Thus, when a Hailstone series reaches 1, then it has *converged* in the sense that the rest of the series is 4, 2, 1, 4, 2, 1, … . input cin >> n; output cout << series numbers << endl cout << length of series Test case 1 Input : 17 Outout : 17 52 26 13 40 20 10 5 16 8 4 2 1 13 Test case 2 Input : 7 Output : 7 22 11 34 17 52 26 13 40 20 10 5 16 8 4 2 1 17 Test case 3 Input : 13 Output : 13 40 20 10 5 16 8 4 2 1 10 **Be Blessed with Recursion**
2.	The Fibonacci strings are a series of recursively-defined strings. F_0 is the string a, F_1 is the string bc, and F_{n+2} is the concatenation of F_n and F_{n+1}. For example, F_2 is abc, F_3 is bcabc, F_4 is abcbcabc, etc. Given a number n and an index k, return the kth character of the string F_n.
3.	Raising a number to a power p is the same as multiplying n by itself p times. Code **a recursive function** called power that takes two arguments, a double value for n and an int value for p, and return the result as double value. Write the main function that gets value from the user to test power function.
4.	Write a program to print the sequence of numbers in reverse order using functions. Input: 10 9 8 7 6 5 4 3 2 1 Output: 1 2 3 4 5 6 7 8 9 10
5.	Write a C++ Program which inputs a sorted array and tells whether the key searched is present in array or not using Binary Search Algorithm recursively.
6.	A positive integer is entered through the keyboard; write a recursive function to find the binary equivalent of the number.