EE1102 Introduction to Programming   **Assignment 4-B**

Total Marks: 70
Due Date and Time: February 26, 2021 6 pm.   <u>No late submission will be permitted.</u>
Submission Procedure: Upload the C program files by the due date and time. The files should be named as specified in each problem statement. Replace ROLLNO with your roll number (all small letters). **Do not upload exe files.**

NOTE: Meaningful messages should be printed when input is required from the user and when output is printed.

Problem 1. Write a C program called ROLLNO_Newton_Raphson.c that takes as input a float number, uses the Newton-Raphson method to compute the cube root of the number, and prints the result.

Refer to the lecture video for *Lec8: Fib sequences and Newton Raphson method for square root*. f(x) for this problem is f(x) = x^3 - N where N is the number for which we have to find the cube root.

Stopping criteria: You can stop iterating if f(x+1) is less than 0.00001 or if the number of times you iterated is greater than 100.

Marks: 20

Problem 2. Write a C program called ROLLNO_bubble_sort.c that takes as input an array of 10 float numbers, sorts the elements in the array in descending order using bubble sort algorithm, and then prints out the sorted array. **You will be asked to explain the algorithm and your code during evaluation.**

Bubble sort works by comparing two adjacent elements in the array and swapping them if they are in wrong order.

Some links for reference:
        https://www.geeksforgeeks.org/bubble-sort/
        https://www.tutorialspoint.com/data_structures_algorithms/bubble_sort_algorithm.htm

Marks: 20

Problem 3. Write a C program called ROLLNO_hex_dec_bin.c that will take as input a string that has the hexadecimal representation of a number (including sign and fractional part). The equivalent value of the number in decimal and binary representation should be computed and printed. The sign and fractional part may or may not be present in the string.

Example: If the string is "1AB", the decimal equivalent is 427 and the binary equivalent is 110101011.

If the user provided an invalid input, an error message should be printed.

Marks: 30