PDS Lab Section 11

Lab Day 4 – December 23, 2020

The top two lines of your programs must contain the following information:
//Roll No.: <Type in your roll no.>
//Name: <Type in your name>

You have to give different names to your C files and upload them in Moodle. Please read the instructions given below.

Document your programs meaningfully using appropriately named variable and sufficient amount of comments as suggested in an earlier email.

1. Read an integer value having less than or equal to 10 digits, and display the different digits in reverse in words. For example, if the integer value entered is 5678, the display should be: eight seven six five.

   Name your C program file as LD4_1_<roll_no>.c. **[15 Marks]**

2. Write a program that reads an integer number (value less than 10) and displays its multiplication table nicely formatted. For example, if the input number is 5, then it should generate:

   5X1=5
   5X2=10
   ...
   5X10=50

   Name your C program file as LD4_2_<roll_no>.c. **[10 Marks]**

3. Write a program that will prompt the user to enter a sequence of positive integer values. At any time, your program should display the two largest values so far entered. When the user has entered only one value, for the second largest number your program should display "Value not yet entered". Your program should terminate when the user enters any negative number.

   For example:

   Enter numbers: 1 ↲
   Largest number: 1
   Second largest number: Value Not yet entered
   Enter numbers: 1 2 5 4 ↲
   Largest number: 5
   Second largest number: 4
   Enter numbers: 1 2 5 4 8 2 ↲
   Largest number: 8
   Second largest number: 5
   Enter numbers: 1 2 5 4 8 2 1 1 ↲
   Largest number: 8
   Second largest number: 5
   Enter numbers: 1 2 5 4 8 2 1 1 -10 ↲
   <Program terminates>

   Here ↲ denotes pressing of enter key.

   Name your C program file as LD4_3_<roll_no>.c. **[15 Marks]**

4. Write a program that takes a positive integer n and displays the first n terms of the following series: 1, -1, 2, -3, 5, -8, ...

   You need to handle cases when the user enters 0 or negative numbers by giving appropriate messages.

   Name your C program file as LD4_4_<roll_no>.c. **[10 Marks]**

5. For any real number x, the series expansion of sin(x) is as follows, where x is in radian:

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \ldots.$$

   Write a program that takes a floating point number x and an integer n. It will compute and print the value of sin(x) (up to three places of decimal) using the above series summed up to the nth term. Note that n can take large values like 100. You are not allowed to use any built in sine function.

   Name your C program file as LD4_5_<roll_no>.c. **[10 Marks]**

Submit your .c files in Moodle against the assignment submission link for Lab Day 4.