CSE4102: Introduction to Computer Applications and Programming

LAB-06

Instructions:

- You are not allowed to use any syntax or functions not covered in the class till date.
- **Do not copy** code from online or another student.
- You have to solve the problems during the sessional class.

Programming Problem-1:

Write a C program that finds the best two scores out of three class tests using a user-defined function. The program should prompt the user for the three test scores, then determine and display the two highest scores.

Sample Output:
Input: Enter three Scores: 12 25 18
Output: The best two scores are: 25,18.

Programming Problem-2:

Write a C program that calculates the sum of all odd numbers from 1 to a given number `n` using a `while` loop. Using a user-defined function to do the calculation.

Sample Output:

Input: Enter the value of n: 5
Output: The sum of odd numbers from 1 to 5 is 9.

Programming Problem-3:

In aircraft design, understanding the wing area is crucial for evaluating performance and stability. In this exercise, you are required to create a C program that defines functions to calculate the area of an aircraft wing based on two common shapes: a rectangle and a trapezoid.The program should allow the user to choose the shape of the wing and input the necessary dimensions.

Requirements:

Define a function named **calculateRectangularWingArea** that takes the length and width of a rectangular wing as parameters and returns the calculated area.

Define a function named **calculateTrapezoidalWingArea** that takes the lengths of the two bases and the height of a trapezoidal wing as parameters and returns the calculated area.

In the main function:

Prompt the user to choose between a rectangular wing and a trapezoidal wing.
Based on the user's choice, request the appropriate dimensions for the selected shape.
Call the corresponding function to compute the area.
Display the calculated area clearly.

Programming Problem-4:

The sinc(x) function is commonly used in many engineering applications. The most common definition for sinc(x) is the following:

$$f(x) = \text{sinc}(x) = \frac{\sin(\pi x)}{\pi x}.$$

The values of this function can be easily computed, except for sinc(0), which gives an indeterminant form of 0/0.

Assume that you want to develop a program that allows the user to enter interval limits, *a* and *b*. The program should then compute and print 21 values of sinc(x) for values of x evenly spaced between a and *b*, inclusively. Thus, the first value of x should be *a*. An increment should then be added to obtain the next value of x, and so on, until the twenty-first value, which should be *b*. Therefore, the increment in x is

$$\text{x\_increment} = \frac{\text{interval width}}{20} = \frac{b - a}{20}.$$

Because sinc(x) is not part of the mathematical functions provided by the Standard C library, you have to implement this problem solution in two ways. In one solution, you include the statements to perform the computations of sinc(x) in the main function; in the other solution, you write a programmer-defined function to compute sinc(x), and then reference the programmer-defined function each time that the computations are needed.