TP10-Function-Part1

Lab's objectives:

- Using function to separate tasks (code grouping) under a name containing a piece of codes which make our code more readable, reusable and easy to fix bugs

Deadline: 6 days

Problem1: Create a function in C programming to display all sequence numbers from 1 to n except the number 10, where n is a parameter of this function.

Example:

INPUT:

Enter a number: 20

Output:

DIsplay number using function displaySequence(1, 20):
1 2 3 4 5 6 7 8 9 11 12 13 14 15 16 17 18 19 20

……..

INPUT:

Enter a number: -7

Output:

Invalid input number. You are only allowed to input the positive number greater than 1.

Problem2: Create a function in C programming to compute a cube of a number n, where n is taken as a parameter of this function. This function has a return value which is the cube of the number n passed though the function parameter. The program asks a user to input the number n, then call the function to compute the cube. Keep the program running as an infinite loop such that the user can test with as many numbers as possible.
Remark: Validate the input number so that it only allows the positive number

Example:

INPUT:

Enter a number: 5

Output:

The cube of 5 equals to: 125

……..

INPUT:

Enter a number: 0

Output:

Error! Invalid input number! You must input a number greater than 0. Please try again!

……..

Problem3: Design a program to be able to find the diameter, circumference and surface of a circle using a function. The function takes one parameter, i.e., the radius. The function should return three data such as the diameter, the circumference, and the area of this circle.
Diameter = 2 x radius, Circumference = 2 x 3.14159 x radius, Area = 3.14159 x radius x radius;
Hint: Make the type of this function to be a structure consisting of diameter. circumference and area variables.

```
struct CircleData{
        float diameter;
```

```
        float area;
        float circumference;
    }
```

The signature (or prototype) of this function is defined as follows:

CircleData **computeDiameterSurface(**float radius**){ ……. }**

Example:

INPUT:

Enter a radius: 7.5

Output:

The properties of a circle with the given radius 7.5 are:
Diameter = 15
Circumference = 47.12
Area = 176.71

Problem4: Write a C program to ask a user for 10 numbers. Create a function to find the minimum and maximum. Finally display those values to the user on screen.

Example:

INPUT:

Enter 10 numbers: 10 20 -12 9 5 28 11 65 10 -5

Output:

Among the input numbers (10 20 -12 9 5 28 11 65 10 -5), we found that:
The minimum number is: -12, and the maximum number is 65.

Problem5: Create a C program to solve the quadratic equation ax^2+bx+c=0 using a function. The function takes 3 parameters which are the coefficients of the equation such as a, b and c. This function returns some structure data such as status code (1: the equation has double root, 2: the equation has 2 roots, 3: the equation has complex roots), root x1, and root x2.

```
struct Root{
    int status_code;
    float x1;
    float x2;
}
```

The signature of this function is defined by: Root **solveQuadratic**(int a, int b, int c)

Deta = b*b – 4ac

1. If deta > 0
   - Status = 1
   - X1 = (-b + sqrt(deta)) / 2a
   - X2 = (-b - sqrt(deta)) / 2a
2. If deta = 0
   - Status = 2
   - X1 = X2 = -b/2a
3. If deta < 0
   - Status = 3
   - X1 = -b/2a
   - X2 = sqrt(-deta) / 2a