Algorithm Development and Programming Fundamentals
MCA SEM-1

Functions

1. Write a C program to collect two numbers from the user and find all prime numbers, armstrong numbers and perfect numbers between them using functions.

2. Write a C program to allow the user input an integer number in decimal format. Provide users with a facility to convert the entered number to Hexadecimal, Octal and Binary formats.

3. Write a C program to solve the following series for N terms using separate functions.

1	1 + 4 – 9 + 16 – 25 +………….up to N
2	1 + ¼ + 1/9 + 1/16 + …………up to N.

4. Compute the lengths of three sides of a triangle formed by three points whose coordinates are given. Check whether a triangle can be formed or not. Then compute the area of the triangle. Next, take a point as input from the user and check whether it is inside or outside the triangle.
   You can use the following function signatures:
   - `double getLength(int point_1_x, int point_1_y, int point_2_x, int point_2_y);`
   - `double getArea(double side_1, double side_2, double side_3);`
   - `int checkPointLocation(int x_points[], int y_points[], int new_x, int new_y)`

   Hint:

When a point resides inside a triangle, the sum of the areas of the triangles formed by taking two adjacent vertices and the point together must be the same as the area of the triangle.

5. Write functions to convert feet to inches, convert inches to centimeters, and convert centimeters to meters. Write a program that prompts a user for a measurement in feet and converts and outputs this value in meters.
    Hint: 1 ft = 12 inches, 1 inch = 2.54 cm, 100 cm = 1 meter

6. Write a C program to calculate the power of an integer using recursion.

7. Run the following program using GCC compiler. Trace the function calls for the following input.

    Input: ***.UDD ot wmocleW***

    ```c
    #include <stdio.h>
    void fun1();
    int main() {
        printf("Enter a sentence: ");
        fun1();
        return 0;
    }

    void fun1() {
        char c;
        scanf("%c", &c);
        if (c != '\n') {
            fun1();
            printf("%c", c);
        }
    }
    ```

8. Write a C program to find Factorial of a Number - N using Recursion.

9. Write a C program to find nth term in Fibonacci Series using Recursion.

10. Write a program in C to count the digits of a given number using recursion.

11. Write a program in C to find the sum of digits of a number using recursion.