DSA Lab

Assignment-1

Q1: Write a C/C++ program to find the Greatest Common Divisor (GCD) of two positive integers using the Euclidean algorithm. The program should take two integers as input from the user and output the GCD.

Requirements:

1. Use a function to implement the Euclidean algorithm for finding the GCD.
2. The program should handle only positive integers.
3. Validate user input to ensure that positive integers are entered.
4. Use appropriate variable types and error checking.

Q2: Write a C/C++ program to generate the Fibonacci series up to a specified term. Implement a function named `generateFibonacci` that takes an integer n as a parameter and prints the Fibonacci series up to the n^{th} term. The program should take user input for the number of terms and output the corresponding Fibonacci series.

Requirements:

1. Use a function (`generateFibonacci`) to generate the Fibonacci series.
2. The program should handle positive integers for the number of terms.
3. Validate user input to ensure that a positive integer is entered.
4. Use appropriate variable types and error checking.

Q3: Write a C/C++ program to calculate the area and perimeter of a rectangle. Implement functions `calculateArea` and `calculatePerimeter` that take the length and width of the rectangle as parameters and return the area and perimeter, respectively. The program should take user input for the length and width of the rectangle and output the calculated area and perimeter.

Requirements:

1. Use functions (`calculateArea` and `calculatePerimeter`) to perform calculations.
2. The program should handle positive values for the length and width.
3. Validate user input to ensure that positive values are entered.
4. Use appropriate variable types and error checking.

Q4: Write a C/C++ program to calculate the volume and surface area of a cylinder. Implement functions `calculateVolume` and `calculateSurfaceArea` that take the radius and height of the cylinder as parameters and return the volume and surface area, respectively. The program should take user input for the radius and height of the cylinder and output the calculated volume and surface area.

Requirements:

1. Use functions (`calculateVolume` and `calculateSurfaceArea`) to perform calculations.
2. The program should handle positive values for the radius and height.
3. Validate user input to ensure that positive values are entered.
4. Use appropriate variable types and error checking.

Q5: Write a C/C++ program that takes an input for the total number of days and calculates the corresponding day, month, and year. It also checks whether the calculated year is a leap year or not.

Q6: Write a program in C/C++ takes a string as input and prints its length, reverses the string, and checks whether it is a palindrome or not.

Q7: Write a program in C/C++ for the `split` function to split a sentence (as a char array) then split and store its words into another array of character arrays.