LAB CYCLE 1

Question 1: Data Types and Manipulation
Develop a program to read a paragraph of text and perform the following tasks:
a. Count the total number of words.
b. Calculate the average word length.
c. Identify and print the longest word.

d. Replace all occurrences of a specific word with another word of your choice.

Question 2: String Encryption

Write a program that reads a sentence from the user and encrypts it using a simple Caesar cipher. The user can specify the shift value. Implement the encryption such that only alphabetic characters are shifted, while maintaining their case.

Question 3: Data Validation and User Input
Develop a program to read student records with their names, ages, and grades. Implement validation checks:
a. Ensure age is a positive integer.
b. Ensure grade is a valid letter grade (A, B, C, D, F).

c. Calculate and display the average age of students with valid records.

Question 4: Password Generator

Write a program to generate a random password for a user. The password should include a mix of uppercase letters, lowercase letters, digits, and special characters. Allow the user to specify the length of the password.

Question 5: Series Summation

Develop a program to calculate the sum of the series: 1 - 2/3 + 3/5 - 4/7 + ... up to a specified number of terms. Allow the user to input the number of terms in the series.

Question 6: Prime Number Checker

Write a program to check whether a given number is prime or not. Implement this using both loops and functions. Additionally, allow the user to input a range and identify all prime numbers within that range.

Question 7: Fibonacci Series with a Twist

Develop a program to generate the Fibonacci series, but with a twist. Allow the user to input the number of terms and generate the series where each term is the sum of the last three terms.

Question 8: Palindrome Checker

Write a program that reads a string and checks if it's a palindrome. A palindrome is a string that reads the same forwards and backwards, ignoring spaces and punctuation.

Question 9: Data Compression

Design a program to read a string and compress it using run-length encoding. In run-length encoding, consecutive repeated characters are replaced with a single character followed by the count of occurrences.

Question 10: Data Reversal

Write a program to reverse the order of elements in a given list. Implement this without using any built-in functions or loops.