SHIV NADAR
UNIVERSITY
CHENNAI

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**
**SCHOOL OF ENGINEERING**

**CS1801 - PROGRAMMING IN C LAB**
**MODEL LAB EXAMINATION QUESTION PAPER - SESSION 1**

# Question 1

1. Given a string, write a C program count the number of vowels, space and consonants.

   **Example:**

   **Input:** a programming

   **Output:** Vowels: 4, Space: 1, Consonants: 8

   Normal variable and array declarations are not allowed. Utilize functions, and dynamic memory allocation(DMA). Read the inputs through command line arguments (CLA) and **append** the output to a file. Follow coding best practices and boundary conditions (BPBC)

| **Algorithm** (30 Marks) | **Functions** (20 Marks) | **DMA** (20 Marks) | **CLA** (10 Marks) | **File** (10 Marks) | **BPBC** (10 Marks) | **Total** (100 Marks) |
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# Question 2

1. Write a C program to find the longest word in a given sentence.

   **Example:**

   **Input:** Programming in C is enjoyable

   **Output:** Programming

   Normal variable and array declarations are not allowed. Utilize functions, and dynamic memory allocation(DMA). Read the inputs through command line arguments (CLA) and **append** the output to a file. Follow coding best practices and boundary conditions (BPBC)

| **Algorithm** (30 Marks) | **Functions** (20 Marks) | **DMA** (20 Marks) | **CLA** (10 Marks) | **File** (10 Marks) | **BPBC** (10 Marks) | **Total** (100 Marks) |
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# Question 3

1. Write a C program to check if a given substring exists within a string and find its starting position. The last word in the string is the substring to search. If it does not exist, return -1.

   **Example:**

   **Input:** A programming gram

   **Output:** Substring 'gram' is found at position: 3

   Normal variable and array declarations are not allowed. Utilize functions, and dynamic memory allocation(DMA). Read the inputs through command line arguments (CLA) and **append** the output to a file. Follow coding best practices and boundary conditions (BPBC)

| **Algorithm** (30 Marks) | **Functions** (20 Marks) | **DMA** (20 Marks) | **CLA** (10 Marks) | **File** (10 Marks) | **BPBC** (10 Marks) | **Total** (100 Marks) |
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# Question 4

1. Write a C program to check if a given number 'n' digit number is an Armstrong number.

   **Example:**

   **Input:** 9474

   **Output:** 9474 is an Armstrong number

   **Explanation:** A number is Armstrong if the sum of its digits raised to the power of the number of digits equals the number itself.

   $9^4 + 4^4 + 7^4 + 4^4 = 9474$

   Normal variable and array declarations are not allowed. Utilize functions, and dynamic memory allocation(DMA). Read the inputs through command line arguments (CLA) and **append** the output to a file. Follow coding best practices and boundary conditions (BPBC)

| **Algorithm** (30 Marks) | **Functions** (20 Marks) | **DMA** (20 Marks) | **CLA** (10 Marks) | **File** (10 Marks) | **BPBC** (10 Marks) | **Total** (100 Marks) |
|---|---|---|---|---|---|---|
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