**Programming Fundamentals**

**Instructions:**

* You must submit CPP files of the program in a folder, named your Registration Number.
* You must upload your lab tasks on CMS.
* All program codes should be written in C/C++. Students should use Visual studio compiler for coding.
* Indent and comment your code.
* Use meaningful variable names
* Plan your code carefully on a piece of paper before you implement it.

**Learning Objectives:**

* Demonstrate knowledge of basic **arrays in** programming C++. (Revision)

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| **CLO NO** | **CLO STATEMENT** | **Blooms Taxonomy Level** | **PLO** |
| 1 | Create solutions for real-world issues while staying within restrictions and making the most use of available resources by utilizing sophisticated problem-solving methods. | P3 | 5 |

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| Lab 05 | |
| **Topic** | * Functions |
| **Objective** | * Need and importance of functions * Divide and conquer strategy * Reusability * Predefine functions, user define functions * Value returning function, void function * Function Prototypes, benefit of function prototype. * Function Definition * Function Calling * Formal parameter, Actual parameter * Value parameter, Reference parameter |

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**TASK TO DO**

**Task 1:**

Write a C++ program that:

* asks the user to enter a positive integer and uses a **function** to check whether the **number is prime or not**. The function should **return 1** if the number is prime and **0** **if it is not**.
* Defines a **void function prime ()** that prints the first 10 prime numbers.
* And **a void function reverseprime()** that prints the first 10 prime numbers in reverse order.

**Sample Output 1:**

Enter a positive integer: 7

7 is a prime number.

First 10 prime numbers are: 2 3 5 7 11 17 19 23 29

Reverse prime numbers are: 29 23 19 17 11 7 5 3 2

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**Task 2:**

Write a program that uses a void function to print a **5x5 matrix** where the main **diagonal is filled with 1s and the rest with 0s.**

**Sample Output:**

1 0 0 0 0

0 1 0 0 0

0 0 1 0 0

0 0 0 1 0

0 0 0 0 1

**Task 3:**

Write a function that takes an integer as input and **returns the factorial** of that number.

**Sample Output:**

Factorial of 5 is 120.

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**Task 4:**

Write a void function void **findGCD(int a, int b)** that takes two numbers as parameters and prints their **greatest common divisor (GCD).**

**Sample Output:**

GCD of 48 and 18 is 6.

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**Task 5:**

Create a function **int countDigits(int num)** that **returns the number of digits** in an integer.

**Sample Output:**

Digits in 3489 = 4

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**Task 6:**

Write a function that takes an **integer array and its size**, and **returns the average** of the elements in the array.

**Sample Output:**

Enter number: 10, 20, 30, 40, 50

Average of the array: 30.00

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**Task 7:**

Write a function that takes an **array and its size and returns the sum of unique elements** (elements that occur only once).

**Sample Output:**

Enter number: 1, 2, 2, 3, 4, 4, 5

Sum of unique elements: 9

**Task 8:**

Write a function that takes an integer **array and its size and returns the sum of the elements located at odd indices.**

**Sample Output:**

Enter numbers= 1, 2, 3, 4, 5, 6

Sum of elements at odd indices: 12

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**Task 9:**

Write a function **int findMax(int arr[], int size)** that **returns the largest number in an array**.

**Sample Output:**

Enter numbers: 7, 3, 12, 4, 9

Number of consonants: 12

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End of LAB 5 😊