**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 01 | |
| **Topic** | ITC-Revision |
| **Objective** | * Introduction & Review   + Program Execution Flow, Concept of TYPE, Identifier, Declaration, Initialization, Expression, Assignment, Selection, Loop, Arrays * Array   + Integer, Character, C-String   + Declaration, Initialization, one by one Input/Output. |

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**TASK TO DO**

**Task 1:**

Debug the code line by line and understand it’s working.

#include <iostream>

using namespace std;

int main()

{

int arr[] = {10, 20, 30, 40, 50};

int size = 5;

cout << "Array elements are:" << endl;

for (int i = 0; i < size; i++)

{

cout << "arr[" << i << "] = " << arr[i] << endl;

}

arr[2] = 100;

cout << " New Array is:" << endl;

for (int i = 0; i < size; i++)

{

cout << "arr[" << i << "] = " << arr[i] << endl;

}

return 0;

}

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**Task 2:**

Write a C++ program that reads an integer representing a student's grade (between 0 and 100) and classifies it into one of the following categories:

* **A**: Grade between 90 and 100
* **B**: Grade between 80 and 89
* **C**: Grade between 70 and 79
* **D**: Grade between 60 and 69
* **F**: Grade below 60

The program should then output the letter grade (A, B, C, D, or F).

**Sample Input:**

Enter marks= 85

**Sample Output:**

Grade = B

**Task 3:**

Write a C++ program that prints all even numbers from 1 to a given number n.

**Sample Input:**

Enter a number = 10

**Sample Output:**

Even numbers are = 2 4 6 8 10

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**Task 4:**

Write a C++ program that prints a right-angled triangle pattern of stars (\*) with n rows. The number of stars in each row is equal to the row number.

**Sample Input :**

Enter number of rows = 5

**Sample Output :**

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**Task 5:**

Write a C++ program that takes an integer input and checks whether the number is positive, negative, or zero.

**Sample Input:**

Enter number= -5

**Sample Output:**

Number is negative

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**Task 6:**

Write a C++ program to print a diamond pattern using stars (\*). The program should take the number of rows as input (which should be odd to create a symmetric pattern).

**Sample Input:**

Enter the number of rows: 5

**Sample Output:**

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**\*\***

**\*\*\***

**\*\***

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**Task 7:**

Debug the given code line by line and understand it’s working.

#include <iostream>

using namespace std;

int main()

{

int n, m;

cout << "Enter the number of rows: ";

cin >> n;

cout << "Enter the number of columns: ";

cin >> m;

for (int i = 1; i <= n; i++)

{

for (int j = 1; j <= m; j++)

{

if (i == 1 || i == n || j == 1 || j == m)

{

cout << "\*";

}

else

{

cout << " ";

}

}

cout << endl;

}

return 0;

}

**Task 8:**

Write a C++ program that checks whether a given character array (string) is a palindrome.

**Sample:**

Input = "madam"

Output= True

Input= "hello"

Output=False

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End of LAB 1 😊