University of Colombo School of Computing
SCS 1301 - Data Structures and Program Design in C
Lab Sheet

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01. Right-angled Triangle Pattern

Write a program to print the following pattern using nested loops:

```
*
**
***
****
```

02. Number Pyramid

Generate a number pyramid of n rows:

1

1 2

1 2 3

…

03. Diamond Star Pattern

Write a C program to print a diamond pattern of stars (*) based on an odd number input n (must be the number of rows in the middle row).

4. Find the Largest Element

Write a program to find the largest number in an array of integers.

5. Reverse an Array

Accept an array of n integers and print it in reverse order.

6. Frequency Count

Count the frequency of each element in an array and display it.

7. Swap Two Numbers (using pointers)

Write a program to swap two integers using pointers.

8. **Pointer to Array**

   Accept `n` integers into an array and print them using pointer arithmetic.

9. **Sum of Array Elements Using Pointers**

   Write a function that accepts an array and its size, and returns the sum using pointers.

10. **Dynamic Memory Allocation**

    Allocate memory dynamically for an array of `n` integers. Accept values and find their average.

EXTRA ACTIVITIES

11. **Matrix Addition**

    Accept two 3x3 matrices and perform their addition. Display the result.

12. **Transpose of Matrix**

    Write a program to accept a 2D matrix and display its transpose using functions and pointers.

13. **String Reversal Using Pointer**

    Accept a string and reverse it using pointers without using `strrev()`.

14. **Find Maximum and Minimum Using Pointers**

    Accept `n` integers into an array and use pointers to find the max and min elements.

15. **Sorting with Pointers (Bubble Sort)**

    Sort an array of integers using bubble sort and pointer manipulation (no array indexing).