Assignment on ICE2122 Data Structure and Algorithm Lab-2025

Lab Assignment-1: Exploring Array Data Structures and Algorithms (Task1, Task2, Task3, Task4, Task5, and Task6)

Objective:

The objective of this lab assignment is to provide students with a comprehensive understanding of arrays, their operations, and algorithms that involve arrays.

Task 1: Array Element Manipulation

1. Create an integer array of size 10.
2. Accept user input to fill the array.
3. Write separate functions to:
    1. Reverse the array.
    2. Count how many elements are even and how many are odd.
    3. Find the second largest element in the array.
    4. Display all results clearly.

Task 2: Searching and Sorting

1. Create an array with 15 random integers (1–100).
2. Implement:
    - **Linear Search and Binary Search:** Find a user-given number and display its position.
    - **Bubble Sort:** Sort the array in ascending order and display it.
3. Print both the original and sorted arrays.

Task 3: Array Statistics

1. Declare an array of 20 integers (random or user input).
2. Write functions to:
    - Count all numbers greater than a given threshold.
    - Find the median and mode of the array.
    - Print how many times each number occurs.

Task 4: Two-Dimensional Arrays

1. Create a 3×3 (or 4×4) matrix using nested lists/arrays.
2. Write functions to:
    - Display the matrix.
    - Find the sum of each row and each column.
    - Find the main diagonal and secondary diagonal sums.

Assignment on ICE2122 Data Structure and Algorithm Lab-2025

Task 5: Array Transformation

1. Initialize an array of 10 integers.
2. Write functions to:
    - Replace all negative numbers with 0.
    - Multiply all even numbers by 2.
    - Create a new array that contains only unique elements (no duplicates).

Task 6: Array Combination

1. Take two arrays of equal length (say 5 elements each).
2. Write a program to:
    - Merge them into a single array.
    - Find common elements between them.
    - Create a third array containing only elements that appear in one of the two arrays (not both).

Students are recommended to complete this assignments on/before 20th October 2025.