

CS23302 DATA STRUCTURES LAB

Week 1

Date: 10.07.2025

Lab 1: Structures, Arrays & Memory Management in C

Part A: Structures and Static Arrays

1. Create a *struct Student* with fields: Roll No, Name, Marks in 3 subjects, and compute average. Store data for 5 students using an array of structures and display the list.
2. Modify the above to display only the students who scored above 75 average marks.

Part B: Pointers and Dynamic Memory

3. Accept 'n' students using *malloc* to dynamically allocate memory. Store and display their data.
 - a) Use *struct + malloc*
 - b) Input/Output using pointer arithmetic
4. Write a program to reverse an array of integers using pointers.

Part C: Basic Modularization and Operations

5. Create a *struct Book* with fields: ID, Title, Price. Write functions to:
 - a) Add a book
 - b) Search a book by ID
 - c) Display all books*(Use an array of structures, simulate a basic library database)*
6. Sort an array of structures (e.g., books by price). Use bubble sort.

Part D: Intro to Abstract Thinking

7. Write a menu-driven program to perform the following:
 - a) Insert element at specific position in an integer array
 - b) Delete element from specific position
 - c) Search for an element (linear search)
 - d) Display array
8. Write a program to simulate stack operations using an array:
 - a) Push (Insertion at first/top), Pop (Deletion at first/top), Display
 - b) Use a fixed-size array (size 10)