Department of
Computer Science & Engineering
University of Liberal Arts Bangladesh

Open-ended experiment-1

Course Title: Data Structure Lab	**Section: 02**
Course Code: CSE 1302	**Semester: Spring 2025**
Total Marks: 36	**Submission Deadline: (until next class)**

General Instructions:

- This is an open-ended experiment. Students are expected to develop their own experiment;
- Show each step of your experimental procedure, data, and calculations;
- Discuss your results with relevant theories;
- Originality of the work is a must;
- Please refer to the assessment rubrics while preparing the report;
- Symbols, notations and abbreviations carry their usual meanings.

CO	Description	Domain/Model	Assessment Tools	Delivery Methods and Activities
CO1	Demonstrate various basic data structures and their operations	Psychomotor/ L2, Affective / L2	Open Ended Lab	Lecture, Class Participation
CO2	Apply appropriate data structure for solving real-world problem	Psychomotor/ L2, Affective / L2	Open Ended Lab	Lecture, Class Participation
CO3	Develop applications using various data structures	Psychomotor/ L2, Affective / L2	Open Ended Lab	Lecture, Class Participation

Problem:

Console-Based CRUD Application:

You are tasked with developing a **simple console-based application** that performs **basic CRUD operations** (Create, Read, Update, Delete) on a list of records.

CRUD:

- **Create** – Add a new record to the system.
- **Read** – Display the records stored in the system.
- **Update** – Modify an existing record based on a unique identifier.
- **Delete** – Remove a specific record from the system.

System Description:

The application will store a list of **records**, each having the following three attributes:

1. A **unique identifier** (e.g., Record ID – integer)
2. A **name or title** (e.g., Name – string, max 50 characters)
3. A **numeric or float value** representing some detail (e.g., Rating, GPA, Score, etc.)

You are required to:

- Implement this system using a **suitable data structure**.

- Use **dynamic memory allocation** to manage the records efficiently at runtime.
- Ensure that all **CRUD operations** are implemented:
  - **Add a new record**
  - **Delete a record by ID**
  - **Update an existing record by ID**
  - **Display all records**
  - **Search for a record by ID**

Open-ended features:

- **Use any programming language.**
- **Use any modern tools to solve the problem.**
- **Use necessary data structures to solve the problem.**

(* Do not copy from others ***)**

Task No.	**Corresponding COs**	**Marks**
1. Provide a detailed explanation of the data structures used in the system.	CO1	2
2. Implement an error free System.	CO1, CO2, CO3	4
3. Prepare and submit a well-structured lab report.		3