**National University of Computer and Emerging Sciences**



Laboratory Manual

for

Data Structures Lab

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| Section | BCS-3G |
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**Objectives:**

In this lab, students will practice:

1. Circular Linked List
2. Queues using Linked List

**Question 1**

Write your code in C++ to implement the following functionality in Circular linked list:

**Insert:** Inserts any given integers at the end of the circular linked list

**InsertBefore:** Take two integers as an argument v1 and v2 and insert v1 before v2.

**Search:** Search a given integer

**Update:** Updates a given integer with another integer

**Check:** Check either the made is a circular linked list or not.

**Question 2**

Implement a template-based queue using **Linked List**. The required member methods are:

1. **void enqueue()**: Adds an element to queue
2. **void dequeue()**: Removes an element from queue
3. **boolisFull():** return true if queue is full else false.
4. **int size()**: returns the count of total elements stored in the stack.
5. **boolisEmpty()**: returns true if the stack is empty else false.
6. **int front()**:  returns the element on the Front of the queue
7. **int rear()**: return the element on the Rear of the queue

**Question 3**

Given a**Queue**(Based on a **Linked List**) of integers of even length. Your task is to arrange the second half elements of the queue to the first half in an alternative manner.

You can use only one extra queue to complete this task

**Example:**

**Input: 3 2 5 6 7 9 8 4**

**Output: 3 7 2 9 5 8 6 4**