COMSATS University Islamabad, Lahore Campus
Department of Computer Science

Assignment 2 – Semester FALL 2023

Course Title:	Data Structures & Algorithms				Course Code:	CSC211	Credit Hours: 4(3,1)
Course Instructor/s:	Mr. Imran Latif				Program Name:	BCS	
Semester:	3rd	Section:	C&D	Batch	FA22		
Total Marks:	**10**	Obtained Marks:			Due Date:	October 26, 2023	
Student's Name:					Reg. No.		

Important Instruction:

- Student is himself/herself responsible for successful submission of assignment on Microsoft Teams.
- Your submission must include the answers in a single pdf file.
- Copied assignment will get zero credit.
- Deadline: September 28,2023 till 11:30 PM

CLO: <1>; Bloom Taxonomy Level: <Applying>

Q-1 Write and test this method:

Node concat(Node list1, Node list2)

//returns: a new list that contains a copy of list1, followed by a copy of list2;

For example, if list1 is {22,33,44,55} and list2 is {66,77,88,99}, then concat (list1,list2) will return the new list {22,33,44,55, 66,77,88,99}.

Note that the three lists should be completely independently of each other. Changing one list should have no effect upon the others.

Q-2 Write and test this method:

void replace (Node list, int I, int x)

//replaces the ith element with x;

For example, if list is {22,33,44,55, 66,77,88,99}, then replace (list, 2, 50) will change list to

{22,33,50,55, 66,77,88,99}.

Q-3 Give an algorithm for finding the second-to-last node in a singly linked list in

Q-4 Give an implementation of the size( ) method for the CircularlyLinkedList class,

assuming that we did not maintain size as an instance variable.

Q-5 Implement a rotate(int d) method in the SinglyLinkedList class, which rotates the given linked list at specified index.

Given linked list

10 20 30 40 50 60

Where d=4

Rotated Linked list

50 60 10 20 30 40

Q-6 Add and test a method for the LinkedQueue class that reverses the order of the elements in the queue.

Q-7 Add and test a method for the LinkedQueue class that removes and returns the element that is second from the front, if it exists.