Issue Date: September 13, 2021 Due date: September 19, 2021

Instructions:

- Plagiarism is defined as "taking and using the thoughts, writings, and inventions of another person as one's own". IBA has a no-compromise policy on Plagiarism – in case, plagiarism is proved student will be given an **F grade**.
- Your assignment should represent your effort. However, you are not expected to work alone. It is fine to discuss the exercises and try to find solutions together, but each student shall write down and submit his/her solutions separately. It is a good academic standard to acknowledge collaborators, so if you worked together with other students, please list their names.
- Electronic Submission on LMS is compulsory.
- The assignment will be graded based on **timely submission on LMS**.

Deliverables:

Submit the JAVA project as a zip folder and submit a word file for descriptive answers.

Question 1. Create a generic doubly Linked List with a head pointer as follows and implement the following methods:

```
class Node <T> {
  T data;
  Node<T> prev;
  Node<T> next;

 Node(T d){ data=d;   }
}
```

```
Public class DLinkedList<T extends Comparable<T>> {
   Node<T> head;

//implement the following Methods here
}
```

1. public boolean isEmpty() // return true if LinkedList is empty
2. public int length() //returns the number of nodes in the list, length is 0 for the empty list;
3. void toString()// print the content of all nodes as comma-separated;
4. void InsertInOrder(T i) // creates a new node with integer value i in ascending order assume no duplicates are allowed;
5. Node find(T i) // return a node with a value i assume no duplicates are allowed.
6. void reverse() // reverses the list by modifying the pointers and rearrange them in reverse;
7. void remove(T i) // removes the node with value i, assume no duplicates are allowed.
8. void addAll(LinkedList l) // appends the list l to the end of the current list, if the current list is nonempty, otherwise lets the head of the current list point to the first element of l if the current list is empty.

Question 2. Determine the Big-Oh of each method you have implemented in the above question in the linked List:

a. with head pointer
b. with both head and tail pointers

	Methods	Big-Oh a. head pointer	Big-Oh b. head and tail pointers
1.	boolean isEmpty()		
2.	int length()		
3.	void print()		
4.	void InsertInOrder(int i)		
5.	Node find(int i)		
6.	void reverse()		
7.	void remove(int i)		
8.	void addAll(List l)		

********** Good Luck **********