Homework Assignments 5

Due date: March 10, 11:55PM EST.

You do not have to write the actual programs for any of the problems, but you may want to experiment with some code to verify your own answers.

Problem 1

The GenericList interface and its GenericLinkedList implementation used in class (see the source code for lecture 6) provide an insertion method that always adds a new node to the back of the list. Assuming that the data item that is stored in the GenericNode object implements the Comparable interface (i.e. has standard definitions of compareTo(...), write the method

```java
void orderedInsert( T item )
```

that adds a new node to the list in a sorted order (from smallest to largest).

Problem 2

In doubly linked lists there are references to both the first and last elements of the list. The node use for such a list is defined as follows:

```java
public class TwoWayNode {
    private int data;
    private TwoWayNode next;
    private TwoWayNode previous;
    public TwoWayNode (int data) {
        this.data = data;
        next = null;
        previous = null;
    }
}
```

Assume that the class provides all the getters and setters.

Implement

```java
void enqueue (int item)
```
and

```java
int deque()
```

methods of a queue that is based on such a doubly linked list (do not write your methods are wrappers). Your queue keeps private data fields called `head` and `tail` that are both reference variables of type `ToWayNode`.

## Problem 3

Answer the following true/false questions. You do not need to explain your answers, but you should make sure you understand why they are what they are.

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## How and what to submit

You can use the template provided at

https://docs.google.com/document/d/1fQEaboeAByjRUyOJoYOseLbp3YCdDUm-H4t1_GQQxT8/edit?usp=sharing

to complete your solution.

**The completed solutions should be submitted as PDF documents to NYU Classes.**