Department of Computer Science and Engineering
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CIIC 4020 / ICOM 4035 – Data Structures
Spring 2019-2020
Laboratory #2 – Lists

Use Eclipse to develop code for the following problems.

1. Consider a non-member static method called totalCount(). This method receives two parameters: 1) a string *s* 2) an array of lists, each of type List<String>.

   Method totalCount finds the total number of copies of string *s* in all the lists in the array. Implement method totalCount.

2. Consider a member method replaceAll() for the List ADT that replaces all the instances of an element e with element f. The method returns the total number of instances replaced. The prototype for the method is as follows:

   ```
   public int replaceAll (E e, E f)
   ```

   And this method to the interface and implement it for the ArrayList and LinkedList classes.

3. Consider a member method reverse() for the List ADT that returns a new List with the elements in reversed order. For example if a List L = {Bob, Mel, Ron, Jil, Ron}, then a call to L.reverse() will return a new list M = {Ron, Jil, Ron, Mel, Bob}. The old list L is not affected. The prototype for the method is a follows:

   ```
   public List<E> reverse()
   ```

   Add this method to the interface and implement for the ArrayList and LinkedList classes. The method returns an empty list if the list L is empty.

4. A doubly linked list is a linked list where every node has a next pointer and also a previous pointer. Finish the implementation of the DoublyLinkedList class (with dummy header and trailer). Search for "TODO" to find where you must add code. Copy/paste the replaceAll and reverse methods from LinkedList and adjust them as needed.