CS206 Lab#3: Linked List

In this lab, we will learn about linked list and get ready for assignment 4.

Exercise 1: Design a class City that represents a city. It should have instance variables to store the following information. Include appropriate constructor and accessors (getters and setters).

1. name of the city
2. population

Exercise 2: Implement a doubly linked list (DLL) that stores a list of City. This need not be a generic DLL. Your DLL should implement the following interface

1. Your DLL should implement the following interface.
   public interface RabbitLinkedListInterface
   {
     int size();
     boolean isEmpty();
     City first();
     City last();
     void addLast(City c);
     void addFirst(City c);
     City removeFirst();
     City removeLast();
     City remove(City r);
   }

2. Test the above methods to make sure they work properly

3. Override toString to print out a list of all stored city names

4. Add the following cities to the list: (Philadelphia, 1,567,442), (New York, 8,550,405), (Houston, 2,296,224), (Chicago, 2,720,546), (Los Angeles, 3,971,883). Print and make sure they are all there

5. Implement private void insertBefore(City newCity, Node n) so that you can insert newCity just before some existing node

6. Use insertBefore to implement public void insertSorted(City c) so that a City c is inserted into the list in order by population (lowest first). (You may find it useful to implement a method private Node firstGreater(City c) which goes through the existing cities and first the first one with a population greater than the city to be added.

7. Insert all cities using insertSorted rather than addFirst or addLast. Print and make sure they are inserted in the correct order.

8. Modify insertSorted to insert in sorted order based on city name
9. Print to show cities in sorted order

When you have completed step 4, send the result to the printer and hand that in.