Queens College
Computer Science Department

CS 212 – Spring 2021 – Project 2

Assigned: 24 March 2021
Due: 9 April 2021
Cutoff: 15 April 2021

Create a class to represent light bulbs

Create a class called Bulb that will represent a light bulb. It should have instance variables for the manufacturer (String), part number (String), wattage (int) and lumens (int). Get and Set methods should be included. Override the equals and toString methods from class Object.

List of Bulbs

Create a class called *BulbNode* which has fields for the *data* (a Bulb) and *next* (BulbNode) instance variables. Include a one-argument constructor which takes a Bulb as a parameter. (For hints, see the PowerPoint on "Static vs. Dynamic Structures".)

```
public BulbNode (Bulb b) {  . . }
```

The instance variables should have protected access. There will not be any get and set methods for the two instance variables.

Create an abstract linked list class called *BulbList.* This should be a linked list with head node as described in lecture. Modify it so that the data type in the nodes is *Bulb*. The no-argument constructor should create an empty list with *first* and *last* pointing to an empty head node, and *length* equal to zero. Include an append method in this class.

Create two more linked list classes that extend the abstract class *BulbList*: One called *UnsortedBulbList* and one called *SortedBulbList*, each with appropriate no-argument constructors. Each of these classes should have a method called *add(Bulb)* that will add a new node to the list. In the case of the UnsortedBulbList it will add it to the end of the list by calling the append method in the super class. In the case of the SortedBulbList it will insert the node in the proper position to keep the list sorted by wattage.

Instantiate two linked lists, and for every Bulb read from the file, add it to the unsorted and sorted lists using the *add* method. You will end up with the first list having the Bulbs from the input file in the order they were read, and in the second list the Bulbs will be in sorted order.

Display the unsorted and sorted Bulbs in a GUI with a GridLayout of one row and two columns. Put the unsorted Bulbs in the left column, and the sorted Bulbs in the right column.

The input file

There will be an input file provided on Blackboard which contains information about bulbs, one per line, with the manufacturer, part number, wattage and lumens separated by commas, such as:

```
Phillips,1237DF2,100,1200
```

You can separate the four items using a StringTokenizer.

Submitting the Project.

You should now have the following files to submit for this project:

```
Project2.java
Bulb.java
BulbGUI.java
BulbNode.java
BulbList.java
UnsortedBulbList.java
SortedBulbList.java
```

Submit a jar file.

Rather than upload all the files above separately, we will use Java's facility to create the equivalent of a zip file that is known as a **J**ava **AR**chive file, or "jar" file.

Instructions on how to create a jar file using Eclipse are on Blackboard. Create a jar file called **Project2.jar** and submit that. **Be sure the jar file contains *source* code**, not classes.