

CS 212 – Spring 2020 – Project 2

Assigned: 17 March 2020
Due: 30 March 2020
Cutoff: 3 April 2020

List of Clocks

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

```
public ClockNode (Clock c) { . . }
```

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 *ClockList*. This should be a linked list with head node as described in lecture. Modify it so that the data type in the nodes is *Clock*. 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 *ClockList*: One called *UnsortedClockList* and one called *SortedClockList*, each with appropriate no-argument constructors. Each of these classes should have a method called *add(Clock)* that will add a new node to the list. In the case of the *UnsortedClockList* it will add it to the end of the list by calling the append method in the super class. In the case of the *SortedClockList* it will insert the node in the proper position to keep the list sorted.

Instantiate two linked lists, and for every *Clock* 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 *Clocks* from the input file in the order they were read, and in the second list the *Clocks* will be in sorted order. Display the unsorted and sorted *Clocks* in the GUI just as in project 1.

Submitting the Project.

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

```
Project2.java  
Clock.java  
ClockGUI.java  
ClockNode.java  
ClockList.java  
UnsortedClockList.java  
SortedClockList.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 **Java 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.