

**CS 212 – Spring 2023 – Project 2**

Assigned: 8 March 2023  
Due: 27 March 2023  
Cutoff: 31 March 2023

**Create a Class for Roman Numerals**

Create a class called *RomanNumeral* which has two private instance variables: the *String* value of the Roman numeral, and an *int* for the Arabic value. It should have a one-argument constructor that takes a *String* as a parameter for the Roman Numeral. For this project we will not do error checking. The constructor should set the Roman numeral instance variable, and convert the Roman numeral to Arabic and set the Arabic integer value. Provide get and set methods for the *String* RomanNumeral and a get method for the Arabic value. Other methods to include are *equals*, *toString*, and *compareTo*.

**Use linked lists to store and sort RomanNumerals**

Create a class called *RomanNumeralList* based on the linked list with head node as shown in lecture. The data in the nodes should be a *RomanNumeral*.

Create a class called *UnsortedRomanNumeralList* that extends *RomanNumeralList*. It should have an *append* method that takes a *RomanNumeral* as a parameter and adds it to the end of the list.

Create a class called *SortedRomanNumeralList* that extends *RomanNumeralList*. It should have a method called *add* which takes a *RomanNumeral* as a parameter and inserts that word into the list in a position so that the list remains sorted.

**Read from the file and add to the sorted list**

For each line in the input file (same file as in project 1), break the line into individual RomanNumerals (Strings) and insert each RomanNumeral into the unsorted list (using *append*), and into the sorted list (using *add*).

Display the results in a GUI with a *GridLayout* of one row and three columns. The first column, as in project 1, should contain the original RomanNumerals, the second column the unsorted Arabic values, and the third column the sorted Arabic values.

**Submitting the Project.**

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

```
Project2.java  
RomanNumeral.java  
RomanNumeralGUI.java  
RomanNumeralList.java  
UnsortedRomanNumeralList.java  
SortedRomanNumeralList.java
```

(You do not have to submit *TextFileInput.java* or the input file.)

**Submit a jar file.**

Create a jar file called **Project2.jar** making sure that it contains **source code** (.java files) and submit that.

Upload your project to Blackboard by the due date for full credit. Do not send projects by email.