IT306 Take Home Assignment 4

Assignment Directions

It is mandatory that you attempt this assignment on your own. You may use any printed resources you would like (text, notes, Internet – not recommended!). You may ask your instructor and TA questions on a limited basis. This is **not** a group assignment; however, limited discussion with your classmates is permitted. You may not work with a tutor or receive assistance on this assignment from outside resources. Sharing your work with a classmate or receiving assistance from someone outside of the course is considered a violation of the Mason Honor Code and results in 0 for the assignment in the first attempt and F in the course for the second attempt.

- **LATE ASSIGNMENT IS NOT ACCEPTED after 11:59 p.m. on the due date. Please don't send your late assignments to me or TA via emails as they will be discarded. You need to submit the softcopy to the myMason Portal on or before 11:59 p.m. If not submitted on time, it is classified as LATE.**
- **All the naming conventions used have to be followed the guidelines:**
- **All the variables have to be declared and initialized inside the method before they are used.**
- **All the arrays have to be declared before they are used.**
- **No global variables are allowed to be used in your application class.**
- **All methods must be structured programs.**

Programming:

In all of the following programming exercises, provide proper documentation to your code. Submit your java files with proper naming. Upload your archived (.zip) file.

1. (50 points) Use the class TNode and TLinkedList discussed in the class and implement the following methods:
   a. (30 points) Search method to perform linear search based on the name field of a scientist object. If the query is found, remove and return the matched Scientist object.
   b. (20 points) Create an add method that keeps nodes sorted in descending order.

2. (30 points) Use the DoublyLinkedList and DoublyNode java classes discussed in the class and change it to support the data type Scientist provided in class. Implement the following method:
   a. Implement the method indexOfElement(Scientist s) to return the index of an input element (based on the name of a scientist). Suppose the elements are unique. Add this method to class DoubleLinkedList.

3- (20 points) Use the CircularLinkedList java class to implement the following method and add it to the CircularLinkedList java class (middle is neither at the beginning nor at the end) :

   public void addToMiddle(LNode newNode) {//TODO }