Lab #2 – Using Fundamental Data Structures

Purpose: The purpose of this Lab assignment is to:

- Design and develop Applications that incorporate fundamental data structures such as:
  - Singly Linked Lists
  - Doubly Linked Lists

References: Read the course's text chapter 3 and the lecture slides. This material provides the necessary information that you need to complete the exercises.

Be sure to read the following general instructions carefully:

- This assignment must be completed individually by all the students.
- You need to create a video clip (roughly about 5min, not more than 10min) to clearly **explain your approach, run your code, and demonstrate your solution.**

Exercise 1

In this exercise, you will add a method *swapNodes* to SinglyLinkedList class. This method should swap two nodes node1 and node2 (and not just their contents) given references only to node1 and node2. The new method should check if node1 and node2 are the same node, etc. Write the main method to test the *swapNodes* method. **Hint**: You may need to traverse the list.

(5 marks)

Exercise 2

In this exercise, you will use the *DoublyLinkedList* implementation of the textbook. Write a method for concatenating two doubly linked lists L and M, with header and trailer sentinel nodes, into a single list L′. Write a main method to test the new method. **Hint**: Connect the end of L into the beginning of M.

(5 marks)

You must name your Eclipse project according to the following rule:
YourFullname_COMP251Labnumber_Exercisenumber.

Example: **JohnSmith_ COMP251Lab2_Ex1**

Submission rules:

Submit your modules as **zip files** that are named according to the following rule:
YourFullname_ COMP251Labnumber_Exercisenumber.zip

Example: **JohnSmith_ COMP251Lab2_Ex1.zip**

Submit the link to your video clip (not more than 4min) that **explains clearly your approach, run your code, and demonstrate your solution.** You could provide the link to your video (on Youtube/Vimeo/…) in the body of your submission or in a separate readme file as a part of the folder submission.