

## 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\_Exercisenumbr.**

Example: **JohnSmith\_COMP251Lab2\_Ex1**

### Submission rules:

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

**YourFullname\_COMP251Labnumber\_Exercisenumbr.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.