COSC 251 – Programming Languages
Project 1
Spring 2009

Objective: Implement a data structure in C/C++ that is easily dealt with in JAVA.

Your Task: You will create an Object Oriented version of the linked list data structure that we will review in class (you all should have seen it in your 201 class). You will code this as a doubly-linked list and will have to provide the following functionality:

>   Addition of a node to the start of the list.
>   Addition of a node to the end of the list.
>   Addition of a node in an arbitrary spot inside of the endpoints.
>   Remove a node at the start of the list.
>   Remove a node at the end of the list.
>   Remove a node in an arbitrary spot inside of the endpoints.
>   Sort the list by id number (see below) in ascending order.
>   Clear the list.
>   Return/Get the node at an arbitrary index.
>   Print out the entire list.

This will test your understanding of pointers and pointer chasing. Each node should be its own object and contain an instantiation of a class called Student which has three private members (int id, double gpa, String name) and get/set functions as well as a constructor. The node class should also contain the pointers that you'll need to complete the functionality of the linked list.

Your LinkedList class should hold your actual linked list made of nodes and contain the functionality noted in the list above.

Deliverables: the class files for Student, Node, LinkedList and a driver that shows that you have completed all of the necessary items.

Expectations: The code should be clean, concise, well-commented and correct. If you use an outside source, be sure to document that source. Significant use of outside sources will result in a deduction. Grading rubric and example binary will be provided a week ahead of the due date.

DUE: February 25th, 11:59pm via Digital Dropbox