**CSC 250 – Program Design Document**

**Structure Chart**

**IntList**

**├── IntList() (constructor)**

**├── IntList(const IntList &obj) (copy constructor)**

**├── ~IntList() (destructor)**

**├── appendNode(int value)**

**├── insertNode(int value)**

**├── deleteNode(int value)**

**├── displayList()**

**├── countNodes()**

**└── countNodes(ListNode \*node) (private)**

**Function Design (give the prototype and a short description for each function)**

1. IntList()

IntList()

* + Default constructor. Initializes head to nullptr.
  + Parameters: None
  + Returns: None

1. IntList(const IntList &obj)

IntList()

* + Copy constructor.
  + Loops through obj list and appends nodes to current list.
  + Parameters:
    - obj - IntList object passed by reference
  + Returns: None

1. ~IntList()

~IntList()

* + Destructor.
  + Deletes all nodes in the list.
  + Parameters: None
  + Returns: None

1. appendNode(int value)

appendNode()

* + Appends a node containing value to the end of the list.
  + Parameters:
    - value - integer value for new node
  + Returns: None

1. insertNode(int value)

insertNode()

* + Inserts a node containing value in the sorted list.
  + Parameters:
    - value - integer value for new node
  + Returns: None

1. deleteNode(int value)

deleteNode()

* + Deletes a node containing value from the list.
  + Parameters:
    - value - integer value of the node to be deleted
  + Returns: None

1. displayList() const

displayList()

* + Displays the nodes in the list.
  + Parameters: None
  + Returns: None

1. countNodes() const

countNodes()

* + Counts the number of nodes in the list.
  + Parameters: None
  + Returns: int

1. countNodes(ListNode \*node) const (private)

countNodes()

* + A private recursive function to count nodes.
  + Parameters:
    - node - pointer to a ListNode
  + Returns: int

**Time Estimate**

|  |  |  |
| --- | --- | --- |
|  | **Estimated Time** | **Actual Time** |
| Program Design |  |  |
| (list each function name and the time required to code each) |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| Program Test |  |  |
| **Total Time** |  |  |