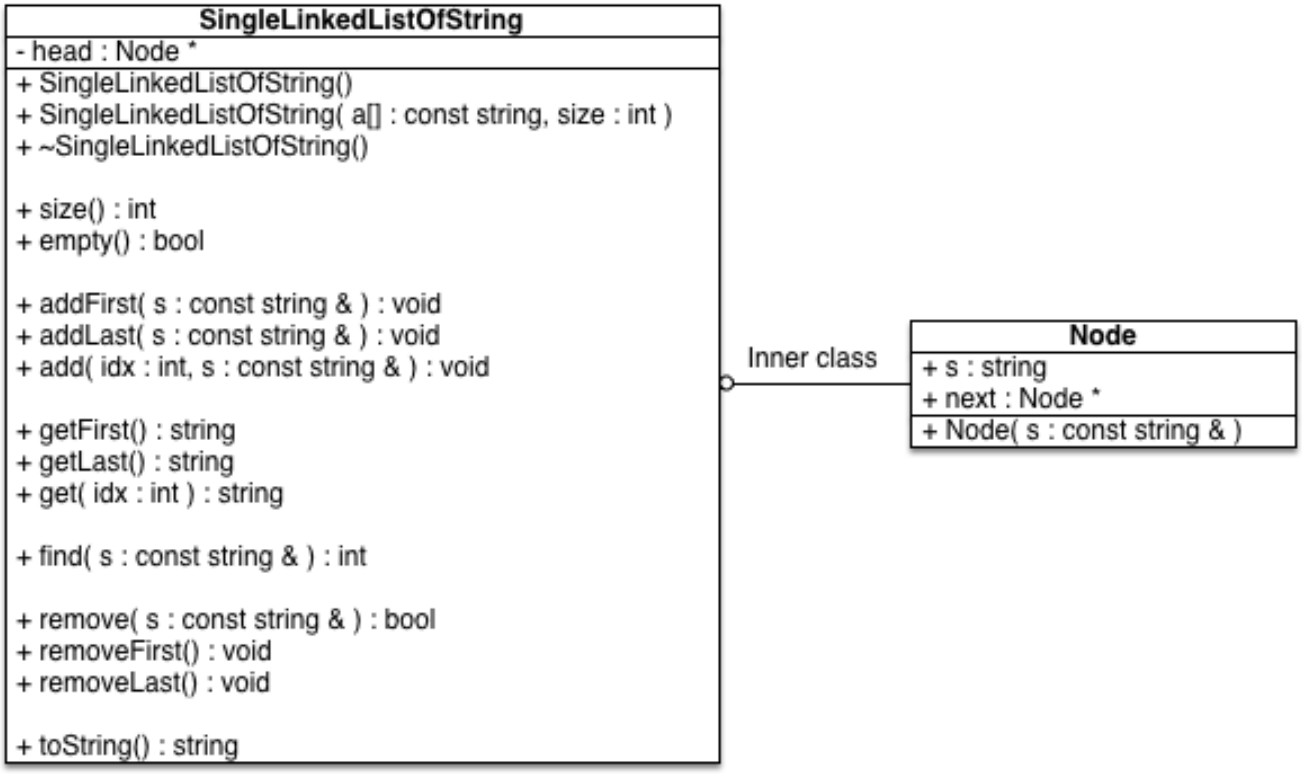
Assignment 7

Implement a single linked list in C++. The list stores string objects. Use the following design for your class. Please use the method names, parameters, and return types exactly as shown in the diagram.



The Node class is an inner class (nested within SingleLinkedListOfString). Separate the interface and implementation of your class, and write a test program to test all of the functionality of your linked list.

The descriptions of each method are listed below:

- SingleLinkedListOfString() create an empty list
- SingleLinkedListOfString(const string a[], int size) initalized the new list with copies of the content of a in the same order.
- ~SingleLinkedListOfString() deallocate all of the memory used by this linked list. Each node should be deleted using delete.
- size() returns the number of elements in the list.
- empty() returns true if the list is empty.
- addFirst(const string & s) adds a copy of s to the front of the list.
- addLast(const string & s) adds a copy of s to the end of the list.
- add(int idx, const string & s) add a copy of s at location idx in the list. If idx is greater than the size of the list, then this method should throw an out_of_range exception.
- getFirst() returns the first string in the list. If the list is empty, this method will throw an

out_of_range exception.

- getLast() returns the last string in the list. If the list is empty, this method will throw an out_of_range exception.
- get(int index) returns the string at location index (0 based). If index is not between 0 and the list size - 1, this should throw and out_of_range exception.
- find(const string & s) return the index of the first node that contains a string that matches s. If the node is not found, return -1.
- remove(const string & s) delete and free space for the first node that contains a string that matches s. If the node is not found, return false, otherwise, return true.
- removeFirst() delete and free space for the first item in the list. If the list is empty, this method does nothing.
- removeLast() delete and free space for the last item in the list. If the list is empty, this method does nothing.
- toString() returns a string representation of the entire list. The format of the list must be exactly as follows. For a list containing the strings “A”, “B”, and “C” (in that order), this method should return the following string: "[A, B, C]".

Submit your program and via Sakai online submission system and turn in a printed copy of your code.