CS2308 - Foundations of Computer Science II
Program Assignment #4
Total Points: 100

Due 11:59 pm on Apr. 19, 2020

In this project, you will design your own linked list to hold a series of integers. Your linked list class should have the following member functions:

- IntList(); – The constructor.
- IntList(const IntList &); - The copy constructor.
- ~IntList(); - The destructor. Make sure the linked list will be destroyed.
- void appendNode(int val); - The function will append a node to the end of the linked list.
- void displayList(); - The function will display all nodes in the linked list.
- void removeByVal(int val); - The function will remove the node with the target value. No node will be removed if the target value cannot be found.
- void removeByPos(int pos); - The function will remove the node located at the target position. No node will be removed if an invalid position is given.
- void insertByPos(int val, int pos); - The function will insert a node with the passed in value to the target position. Append the node to the end of the list if the target position is too big.
- int search(int val); - The function will return the position of a node with the search value. Return -1 if the search value cannot be found.

The class specification file (IntList.h) and the test program (test.cpp) have been provided to you. You need to complete the IntList.cpp file, which contains the implementation of all member functions of the Linked List. You must complete the IntList.cpp file based on the provided .h file.

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Timeline:

Apr. 8:	The constructor and destructor completed.
Apr. 10:	The appendNode() and displyList() functions completed.
Apr. 14:	The removeByVal() and removeByPos() functions completed.
Apr. 18:	The insertByPos(), search() and copy constructor functions completed.
Apr. 19:	Due Date. You program should be fully commented and tested.

Comments and Suggestions:

DO NOT DELAY. Start writing the program from Day 1. If you wait until the night before the due date, you will have a miserable night and it is less likely you could complete the project.

Notes:

- Your program must correctly compile and be executable on the Linux server.
- Be sure your code files follow the format of the coding standard.
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Program Submission

Please submit only your source file (firstname_lastname_prog4.zip) to TRACS. Your zip file should include IntList.h, IntList.cpp and test.cpp. You can also include a makefile but it is not required.

You will get zero if you fail to submit your project to TRACS before the deadline.

**********Sample Output**********

```
Here are the initial values:
2 -> 4 -> 6 -> 8 -> 10

Now inserting the value 5 at position 2.
Here are the nodes now.
2 -> 4 -> 5 -> 6 -> 8 -> 10

Now deleting the node holding 10.
Here are the nodes left.
2 -> 4 -> 5 -> 6 -> 8

Now removing node at position 1.
2 -> 5 -> 6 -> 8

Now try to remove node at position 99.
2 -> 5 -> 6 -> 8

Now search the position of node with value 6.
The node with value 6 is located at position: 2

Now search the position of node with value -999 (does not exist).
The node with value -999 is located at position: -1

Now delete the node with value 6.
2 -> 5 -> 8

Here are the nodes in the second list.
2 -> 5 -> 8
```

Your program will be graded as follows, please make sure to check each item before you submit.

CS2308 Program #4 Name:_____

Program and Run Time Output: _____ (90 Points)

_____ (2) Correctly implement the Constructor function

_____ (10) Correctly implement the Copy Constructor function

_____ (10) Correctly implement the Destructor function

_____ (10) Correctly implement the appendNode() function

_____ (8) Correctly implement the displayList() function

_____ (10) Correctly implement the removeByVal() function

_____ (15) Correctly implement the removeByPos() function

_____ (15) Correctly implement the insertByPos() function

_____ (10) Correctly implement the search() function

Coding Standards: _____ (10 Points)

_____ (3) Documentation (program and function headers)

_____ (3) Comments

_____ (2) Meaningful Variable Names

_____ (2) Indentation Scheme / Use of { }

Total: _____ (100 Points)

Executable Version: _____ (%)

If your code cannot be compiled or executed, your final score will only be 50% of your accumulated score of each item above.

Final Score: _____ (100 Points)