Maximum possible points: 100

Due date: 09/02/2019 11:59 pm for Monday Lab
09/04/2019 11:59 pm for Wednesday Lab
09/06/2019 11:59 pm for Friday Lab

General Instructions:
In this lab you will implement a Doubly Linked List and some operations in C++. This lab will help you brush up on your basic C++ concepts. Your program is expected to produce output as shown in the document. It should take input from a text file of integers (e.g., data.txt). Numbers from the text file should be read one by one and fed as input into the nodes of the doubly linked list. You can’t store the input data in an array/vector. Instead, it should be strictly stored in the doubly linked list. **Your program should handle the duplicate numbers in the following way. Duplicate values can be inserted in the list. When the delete function is called, it should remove the first occurrence of the duplicate number.**

Operations on Doubly Linked List:

1. IsEmpty() : Returns true if list is empty or head node is NULL.
2. Insert(x): Inserts an element at the end of linked list.
3. Delete(x): Deletes an element given if present and deletes the first occurrence of the duplicate value
4. Smallest: Finds smallest element from the list.
5. Largest: Finds largest element from the list.
6. Average: Finds average of all the elements of the list.
7. Merge2Lists: Merges the new list with the old list. New merged list should be sorted in ascending order.
8. Print(): Prints all elements of the list.
9. ReverseList(): returns the reversed list of the original list.

Expected Output:

data.txt elements: 12 25 27 8 2 57 43 90 4 66 1

Your program should produce the menu below and should work as per the sample given below. However, we will test your code with inputs other than the one shown below.

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 7

List: 12 25 27 8 2 57 43 90 4 66 1

-------------------------------------------------------------------------------------------------------------------

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 1

Enter element to be inserted in list: 5

-------------------------------------------------------------------------------------------------------------------

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 7

List: 12 25 27 8 2 57 43 90 4 66 1 5

-------------------------------------------------------------------------------------------------------------------

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 1

Enter element to be inserted in list: 27

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 7

List: 12 25 27 8 2 57 43 90 4 66 1 5 27

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 2

Enter the number to be deleted: 43
Delete was successful.

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 7

List: 12 25 27 8 2 57 90 4 66 1 5 27

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 2

Enter the number to be deleted: 27

Delete was successful.

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 7
List: 12 25 8 2 57 90 4 66 1 5 27

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 2
Enter the number to be deleted: 77
Delete failed. Number was not found in the list.

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 3
Smallest number: 1

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 4

Largest number: 90

-------------------------------------------------------------------------------------------------------------------

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 5

Average: 27

-------------------------------------------------------------------------------------------------------------------

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 6

Enter new list to be merged

21 11 9 92 23 38 61
Merged List: 1 2 4 5 8 9 11 12 21 23 25 27 38 57 66 90 92

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 7

List: 1 2 4 5 8 9 11 12 21 23 25 27 38 57 66 90 92

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. ReverseList
9. Exit

>> 8

List: 92 90 66 57 38 27 25 21 12 11 9 8 5 4 2 1

Choose one operation from the options below:

1. Insert
2. Delete
3. Find smallest number
4. Find largest number
5. Average of numbers
6. Merge2Lists
7. Print
8. Exit
9. ReverseList

>> 9

Done!

Submission instructions:

- All files, i.e., the source files and Makefile (or Readme.txt) should be zipped in a folder.
- The naming convention of the folder should be LastName_Lab1.zip (or .tar or .rar or .gz).
- Email it to: chiranjeevi.pippalla@ku.edu or anubhav@ku.edu (your respective lab instructor) with subject line EECS 560 Lab1.
- Your program should run on the Linux machines in Eaton 1005D using g++. 