University of Management and Technology

Data Structures and Algorithms

Assignment # 2

Start Date: 18-11-2023 **Section:** V16 **Marks: 50**

Due Date: 26-11-2023

Read this before solving your assignment

1. This is group assignment.
2. Group should not be more than 2 members.
3. Only one person of the group will update the file.
4. Sharing of assignment ideas, content, solutions is **not permissible** other than your group member.
5. Your performance during viva sessions will play a lead role to determine your grades.
6. Please submit the assignment as per given deadline. Late submitters will be not accepted
7. Upload zip folder containing three .cpp file.
8. The name of folder should be like yourName_yourRollNumber.
9. Mention your Names and Roll numbers on top of .cpp file.
10. The name of .cpp file should be like question1, question2, question3.

Evaluation of Assignment

Following are the evaluation criteria of your assignment.

Feature	**Assessment Criteria**	**Marks**
Present ability	Code is clean, properly formatted, proper user menu, handle all the exceptions and follow the instructions	10
Assignment Content	Question 1	15
	Question 2	15
	Question 3	10

Question 1:

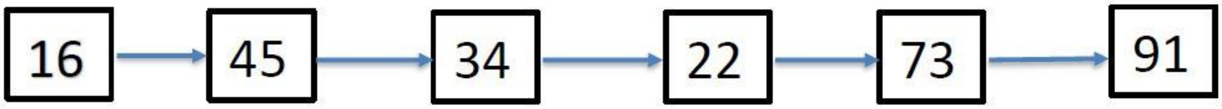
We are asked to build an address book that is capable of storing name, address and phone number of a person. Your program will get the information in the form of input (name, address and phone number) from console. This data will be stored in a linked list in alphabetical order i.e. all names that start from letter A will come first following the names that start from letter B and so on. Your program will get the information of a person from console. After inserting the required information, the node will be inserted in the linked list in the right place. Furthermore, you are required to write a find function for list class that will help you in finding a person record by passing its name. As it is the program for phone directory, so must include the user manual properly. And your program must not be terminated until unless user press a specific key.

Question 2:

Make a linked list class with all required functionalities.

- Keep taking integer inputs from the user unless -1 is entered.

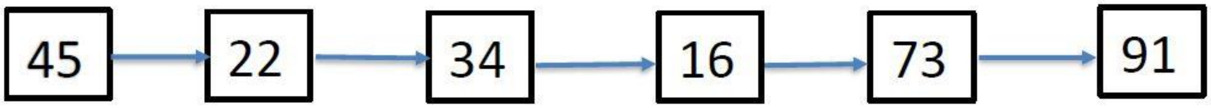
- The inputs are the indexes of the linked list you need to arrange in DECENDING order.



Take the linked list above as an example, if the user enters the following values:

4
2
1
-1

The linked list should be altered as following:



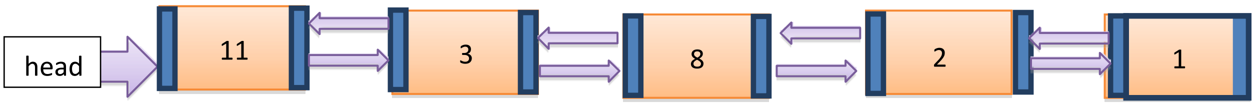
NOTE:

- The first node of linked list considers as index 1.
- You are not allowed to swap the data.
- The nodes should be swapped
- The user can enter as many indexes as much he/she want. If some index entered by user is an invalid index, ignore that value and word on the valid indexes.
- Display that which particular index was invalid.
- Display unsorted as well as sorted list too.
- Above mentioned linked list is just sample linked-list. Your program must be generalized. Generalization in the form user can add as many nodes as much he/she want. That's why make a use manual too for this program.

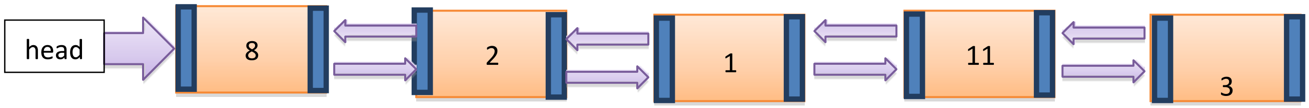
Question 3:

You are required to write a program that will changes the head of the doubly linked list to the specified position. Remember after these changes your list should remain a valid doubly linked List.

The prototype of the function is as follows:



after calling positionHead(3)



NOTE:

- User can enter the position.
- Display unsorted as well as sorted list too.
- Above mentioned linked list is just sample linked-list. Your program must be generalized. Generalization in the form user can add as many nodes as much he/she want. That’s why make a use manual too for this program.