National University

Of Computer & Emerging Sciences Peshawar Campus

CL-210
Data Structures
Lab # 4 and 5 Task

Objectives:

- Linked List(insertion)
- Linked List(deletion)
- Linked List(searching)
- Linked List(Traversal)

Note: Carefully read the following instructions (*Each instruction contains a weightage*)

1. There must be a block of comments at start of every question's code by students; the block should contain brief description about functionality of code.
2. Comment on every function and about its functionality.
3. Mention comments where necessary such as comments with variables, loop, classes etc to increase code understandability.
4. Use understandable name of variables.
5. Proper indentation of code is essential.
6. Write a code in C++ language.
7. Make a Microsoft Word file and paste all of your C++ code with all possible screenshots of every task **outputs in Microsoft Word and submit word file. Submit all .cpp file.**
8. First think about statement problems and then write/draw your logic on copy.
9. After copy pencil work, code the problem statement on MS Studio C++ compiler.
10. At the end when you done your tasks, attached C++ created files in MS word file and make your submission on Google Classroom. (Make sure your submission is completed).
11. Please submit your file in this format **19F1234_L4**.
12. Do not submit your assignment after deadline. Late and email submission is not accepted.
13. Do not copy code from any source otherwise you will be penalized with negative marks.

Problem: 1 | Insertion in Linked list

Write a C++ program to insert values at the beginning, middle and at the end of a Single Linked List.

Problem: 2 | Concatenating Lists

Write a program that concatenates two linked list objects of characters. The program should include function concatenate, which takes references to both list objects as arguments and concatenates the second list to the first list.

Problem: 3 | Merging Ordered Lists

Write a program that merges two ordered list objects of integers into a single ordered list object of integers. Function merge should receive references to each of the list objects to be merged and reference to a list object into which the merged elements will be placed.

Problem: 4 | Summing and Averaging Elements in a List

Write a program that inserts 15 random integers from 0 to 100 in order in a linked list object. The program should calculate the sum of the elements and the floating-point average of the elements.

Problem: 5 | Copying a List in Reverse Order

Write a program that creates a linked list object of 10 characters and creates a second list object containing a copy of the first list, but in reverse order.

Problem: 6 | Inserting middle

Write a program that creates an even number of links in a link list and then finds the middle of the link list and insert a data item in the list.

Problem: 7 |

Write a C++ program to move the last node to the front of a Singly Linked List.
Example:
Given: 1->2->3->4->NULL
Return: 4->1->2->3->NULL

Problem: 8 | Linked List the Palindrome

Write a function to check whether the given Singly Linked List is Palindrome or not.

Problem: 9 | Remove Duplicates

Write a RemoveDuplicates() function which takes a list sorted in increasing order and deletes any duplicate nodes from the list. Ideally, the list should only be traversed once.

 Best of luck