CL-210

Data Structures

Lab # 3

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| Objectives:  1. Singly Linked List |

**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 about its functionality.
3. Use understandable name of variables.
4. Proper indentation of code is essential.
5. Make separate .cpp files for all tasks and use this format **22F-1234\_Task1.cpp.**
6. First think about statement problems and then write/draw your logic on copy.
7. After copy pencil work, code the problem statement on C++ compiler.
8. Make a Microsoft Word file and paste all of your C++ code with all possible screenshots of every **task output in MS word and submit .cpp file with word file**.
9. Please submit your file in this format **22F-1234\_L1**.
10. Do not submit your assignment **after the deadline**.
11. **Do not copy code from any source otherwise you will be penalized with negative marks.**

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| **Problem 1:** |

Write a function to create a singly linked list of n nodes and display it in reverse order.

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| **Problem 2:** |

Write a C++ program to perform Binary Search on a Singly Linked List.

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| **Problem 3:** |

Given a singly linked list, group all odd nodes together followed by the even nodes. Please note here we are talking about the node number and not the value in the nodes.

Example: Given: 1->2->3->4->5->NULL

Return: 1->3->5->2->4->NULL.

Note: The relative order inside both the even and odd groups should remain as it was in the input. The first node is considered odd, the second node even and so on…

**Problem 4:**

Write a generic program to search any node in a singly linked list. If the searched node doesn’t exist, your program should display “Searched node not found” message.



**Problem 5:**

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



**Problem 6:**

Implement a singly linked list class with the following problem: You are building a music player application that stores a playlist of songs. Each song has a title and an artist. You need to design the data structure and provide operations to add a song to the playlist, remove a song from the playlist, and display the current playlist. Implement following operations

1. Add song/ songs anywhere in a playlist.

2. Remove song/ songs anywhere from a play list.

3. Display PlayList of all added songs