PSG College of Technology
Department of Applied Mathematics and Comlutational Sciences
20XW26 M.Sc SS Data Structures Lab
Linked List
Worksheet 5

1. Write a menu driven program to implement a singly list with the following options,

    1. Insert in the beginning
    2. Insert at end
    3. insert in the middle
    4. delete in the front
    5. delete at last
    6. delete any element (given postion, given item)
    7. search for an element
    8. count the number of elements
    9. display the linked list
    10. display the sum of all elements in linked list in a newly created node attached to the front of the singly linked list.

2. Create a linked list to store the details of account like acc number, customer name, balance. Insert atleast 5 account details. Find the customer with greater balance. Display all accounts with balance greater than 10,000. Add an interest of 3% to account with balance>12,000. Display the details of a given customer.

3. Given a linked list, **reverse K alternate nodes** of it. For example,

```
Example 1:
Original list : 1->2->3->4->5->6 K = 2;
Output list : 2->1->3->4->6->5

Example 2:
Original list : 1->2->3->4->5->6->7->NULL K = 3;
Output list : 3->2->1->4->5->6->7
```

4. Given a sorted singly linked list and a value x, the task is to find pair whose sum is equal to x.

Examples:

```
Input : head = 3-->6-->7-->8-->9-->10-->11 , x=17
Output: (6, 11), (7, 10), (8, 9)
```

5. You’re given the pointer to the head nodes of two linked lists. Compare the data in the nodes of the linked lists to check if they are equal. The lists are equal only if they have the same number of nodes and corresponding nodes contain the same data. Either head pointer given may be null meaning that the corresponding list is empty.

6. Check whether a given singly linked list is palindrome or not.

Input:

```
a -> b-> NULL
a -> b -> a-> NULL
s -> a -> g -> a -> r-> NULL
r -> a -> d -> a -> r-> NULL
```

Output:

```
not palindrome
palindrome
not palindrome
palindrome
```

7. Given a singly linked list, **delete N nodes after M nodes.** By delete n nodes after m nodes, we mean that start from head of list, skip M nodes, then delete next N nodes., again skip M nodes, then delete N nodes and so on till end of list. Example:

```
List : 1->2->3->4->5->6->7->8->9->10->Null N =2, M =3
Output : 1->2->3->6->7->8->Null
```

In above example, three nodes: 1,2 and 3 are skipped, then 2 nodes:4,5 are deleted and then again next three nodes 6,7,and 8 are skipped and then 9,10 are deleted and linked list is finished.

8. Find the middle element in singly linked list.

9. Consider the linked list 1->2->0->2->1->0->1->2. Output is : 0->0->1->1->1->2->2->NULL

10. Consider a linked list, segregate alternate elements into two differernt linked lists.

Eg. 1->2->3->4->5->6->NULL

Output : 1->3->5->NULL and 2->3->6->NULL

11. Implement Queues and stack using singly linkedlist

12. Implement insertion after a given position in circular linked listand delete alternate nodes in circular linkedlist.