MCA Semester 1	Subject : Advanced Data Structures Lab
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Roll No. : MCA2511	Date : 31-10-2025

1) Demonstrate the working of a singly linked list with operations to insert, delete, search, display and count the number of nodes.

Code:

```
import java.util.Scanner;

//Class Node
class Node
{
	int data;
	Node next;

	public Node(int d)
	{
		data = d;
		next = null;
	}//end of Node DConstructor
}//end of class Node

//Class List
class List
{
	Node head;

	public List()
	{
		head = null;
	}//end of List DConstructor

	//Insert
	public void Insert(int x)
	{
		//Make a new Node
		Node t = new Node(x);

		//Fisrt node in SLL
		if(head==null)
		{
```

```
                        head = t;
                        return;
                }

                //3. Traverse till last node and link t
                Node tmp = head;
                while(tmp.next!=null)
                {
                        tmp = tmp.next;
                }
                tmp.next = t;

        }//end of Insert

        //Delete

        //Search

        //Count

        //Display
        public void Display()
        {
                System.out.println("SLL contains: ");
                Node tmp = head;
                System.out.print(tmp.data);
                while(tmp.next!=null)
                {
                        tmp = tmp.next;
                        System.out.print("->" + tmp.data);
                }
        }
}//end of class List

//Main Class SLL
class SLL
{
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                List s = new List();

                int ch;

                do
                {
```

```
                System.out.println("\n-------------------------");
                System.out.println(" Singly Linked List Menu");
                System.out.println("-------------------------");
                System.out.println("1. Insert at the end of SLL");
                System.out.println("2. Delete an element");
                System.out.println("3. Search for an element");
                System.out.println("4. Count the number of nodes in SLL");
                System.out.println("5. Display the SLL");
                System.out.println("6. Exit\n");

                System.out.print("Enter your Choice: ");
                ch = sc.nextInt();

                switch(ch)
                {
                        case 1:
                                System.out.print("Enter a Value: ");
                                int x = sc.nextInt();
                                s.Insert(x);
                        break;

                        case 2:
                        break;

                        case 3:
                        break;

                        case 4:
                        break;

                        case 5:
                                s.Display();
                        break;

                        case 6:
                                System.out.println("Exiting Program..... :)");
                        break;

                        default:
                                System.out.println("Incorrect Choice Try again");
                        break;
                }
        }while(ch!=6);
    }//end of psvm
}//end of class SLL
```

Output:

```
A:\MCA2511\DS_LAB>javac 10SLL.java

A:\MCA2511\DS_LAB>java SLL

-------------------------
 Singly Linked List Menu
-------------------------
1. Insert at the end of SLL
2. Delete an element
3. Search for an element
4. Count the number of nodes in SLL
5. Display the SLL
6. Exit

Enter your Choice: 1
Enter a Value: 50

-------------------------
 Singly Linked List Menu
-------------------------
1. Insert at the end of SLL
2. Delete an element
3. Search for an element
4. Count the number of nodes in SLL
5. Display the SLL
6. Exit

Enter your Choice: 1
Enter a Value: 60

-------------------------
 Singly Linked List Menu
-------------------------
1. Insert at the end of SLL
```

```
3. Search for an element
4. Count the number of nodes in SLL
5. Display the SLL
6. Exit

Enter your Choice: 1
Enter a Value: 80

-------------------------
 Singly Linked List Menu
-------------------------
1. Insert at the end of SLL
2. Delete an element
3. Search for an element
4. Count the number of nodes in SLL
5. Display the SLL
6. Exit

Enter your Choice: 1
Enter a Value: 60

-------------------------
 Singly Linked List Menu
-------------------------
1. Insert at the end of SLL
2. Delete an element
3. Search for an element
4. Count the number of nodes in SLL
5. Display the SLL
6. Exit

Enter your Choice: 1
Enter a Value: 30
```

```
3. Search for an element
4. Count the number of nodes in SLL
5. Display the SLL
6. Exit

Enter your Choice: 1
Enter a Value: 30

--------------------------
 Singly Linked List Menu
--------------------------
1. Insert at the end of SLL
2. Delete an element
3. Search for an element
4. Count the number of nodes in SLL
5. Display the SLL
6. Exit

Enter your Choice: 5
SLL contains:
50->60->80->60->30
--------------------------
 Singly Linked List Menu
--------------------------
1. Insert at the end of SLL
2. Delete an element
3. Search for an element
4. Count the number of nodes in SLL
5. Display the SLL
6. Exit

Enter your Choice: 6
Exiting Program..... :)

A:\MCA2511\DS_LAB>
```