Laboratory Component 7:

Design, Develop and Implement a menu driven Program in C for the following operations on Singly Linked List (SLL) of Student Data with the fields: USN, Name, Branch, Sem, PhNo

a. Create a SLL of N Students Data by using front insertion.
b. Display the status of SLL and count the number of nodes in it
c. Perform Insertion / Deletion at End of SLL
d. Perform Insertion / Deletion at Front of SLL(Demonstration of stack)
e. Exit

```
#include<stdio.h>
#include<stdlib.h>

struct node
{
   char usn[25],name[25],branch[25];
   int sem;
   long int phone;
   struct node *link;
};
typedef struct node * NODE;

NODE start = NULL;
int count=0;

NODE create()
{
   NODE snode;
   snode = (NODE)malloc(sizeof(struct node));
   printf("\nEnter the usn,Name,Branch, sem,PhoneNo of the student:");
   scanf("%s %s %s %d %ld",snode->usn, snode->name, snode->branch, &snode->sem,
&snode->phone);
   snode->link=NULL;
   count++;
   return snode;
}


NODE insertfront()
{
   NODE temp;
   temp = create();
   if(start == NULL)
   {
         return temp;
   }

   temp->link = start;
   return temp;
}
```

```
NODE deletefront()
{
   NODE temp;
   if(start == NULL)
   {
      printf("\nLinked list is empty");
      return NULL;
   }

   if(start->link == NULL)
   {
         printf("\nThe Student node with usn:%s is deleted ",start->usn);
         count--;
         free(start);
         return NULL;
   }
   temp = start;
   start = start->link;
   printf("\nThe Student node with usn:%s is deleted",temp->usn);
   count--;
   free(temp);
   return start;
}

NODE insertend()
{
   NODE cur,temp;
   temp = create();

   if(start == NULL)
   {
    return temp;
   }
   cur = start;
   while(cur->link !=NULL)
   {
       cur = cur->link;
   }
   cur->link = temp;
   return start;
}

NODE deleteend()
{
    NODE cur,prev;
    if(start == NULL)
    {
      printf("\nLinked List is empty");
      return NULL;
    }
```

```
if(start->link == NULL)
    {
      printf("\nThe student node with the usn:%s is deleted",start->usn);
      free(start);
      count--;
      return NULL;
    }

    prev = NULL;
    cur = start;
    while(cur->link!=NULL)
    {
       prev = cur;
       cur = cur->link;
    }

     printf("\nThe student node with the usn:%s is deleted",cur->usn);
     free(cur);
     prev->link = NULL;
     count--;
     return start;
}

void display()
{
   NODE cur;
   int num=1;


   if(start == NULL)
   {

      printf("\nNo Contents to display in SLL \n");
      return;
   }
   printf("\nThe contents of SLL: \n");
   cur = start;
   while(cur!=NULL)
   {
     printf("\n||%d|| USN:%s| Name:%s| Branch:%s| Sem:%d| Ph:%ld|",num,cur->usn, cur-
>name,cur->branch, cur->sem,cur->phone);
      cur = cur->link;
      num++;
   }
   printf("\n No of student nodes is %d \n",count);
}

void stackdemo()
{
  int ch;
  while(1)
  {
    printf("\n~~~Stack Demo using SLL~~~\n");
```

```
    printf("\n1:Push operation \n2: Pop operation \n3: Display \n4:Exit \n");
    printf("\nEnter your choice for stack demo");
    scanf("%d",&ch);

    switch(ch)
    {
      case 1: start = insertfront();
              break;
      case 2: start = deletefront();
              break;
      case 3: display();
             break;
     default : return;
    }
   }
  return;
}

int main()
{
   int ch,i,n;
   while(1)
   {
      printf("\n~~~Menu~~~");
      printf("\nEnter your choice for SLL operation \n");
      printf("\n1:Create SLL of Student Nodes");
      printf("\n2:DisplayStatus");
      printf("\n3:InsertAtEnd");
      printf("\n4:DeleteAtEnd");
      printf("\n5:Stack Demo using SLL(Insertion and Deletion at Front)");
      printf("\n6:Exit \n");
      printf("\nEnter your choice:");
      scanf("%d",&ch);

      switch(ch)
      {
      case 1 : printf("\nEnter the no of students:    ");
               scanf("%d",&n);
               for(i=1;i<=n;i++)
                  start = insertfront();
               break;

      case 2: display();
              break;

      case 3: start = insertend();
              break;

      case 4: start = deleteend();
              break;

      case 5: stackdemo();
              break;
```

```
        case 6: exit(0);

        default: printf("\nPlease enter the valid choice");

        }
    }
}
```