**Program 7**

**Develop a menu driven Program in C for the following operations on Singly Linked List (SLL) of Student Data with the fields: USN, Name, Programme, 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));  
  
    if(snode == NULL)  
    {  
        printf("\nMemory is not available");  
        exit(1);  
    }  
    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");  
  
        }  
    }  
}