**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 and Deletion at End of SLL**

**d. Perform Insertion and Deletion at Front of SLL**

**e. Demonstrate how this SLL can be used as STACK and QUEUE**

**f. Exit**

#include<stdio.h>

#include<stdlib.h>

#include<string.h>

int count=0;

struct node

{

int sem,phno;

char name[20],branch[10],usn[20];

struct node \*next;

}\*first=NULL,\*last=NULL,\*temp=NULL, \*temp1;

void create()

{

int sem,phno;

char name[20],branch[10],usn[20];

temp=(struct node\*)malloc(sizeof(struct node));

printf("\n Enter usn,name, branch, sem, phno of student : ");

scanf("%s %s %s %d %d", usn, name,branch, &sem,&phno);

strcpy(temp->usn,usn);

strcpy(temp->name,name);

strcpy(temp->branch,branch);

temp->sem = sem;

temp->phno = phno;

temp->next=NULL;

count++;

}

void insert\_atfirst()

{

if (first == NULL)

{

create();

first = temp;

last = first;

}

else

{

create();

temp->next = first;

first = temp;

}

}

void insert\_atlast()

{

if(first==NULL)

{

create();

first = temp;

last = first;

}

else

{

create();

last->next = temp;

last = temp;

}

}

void display()

{

temp1=first;

if(temp1 == NULL)

{

printf("List empty to display \n");

return;

}

printf("\n Linked list elements from begining : \n");

while (temp1!= NULL)

{

printf("%s %s %s %d %d\n", temp1->usn, temp1->name,temp1->branch,temp1->sem,

temp1->phno );

temp1 = temp1->next;

}

printf(" No of students = %d ", count);

}

int deleteend()

{

struct node \*temp;

temp=first;

if(temp->next==NULL)

{

free(temp);

first=NULL;

}

else

{

while(temp->next!=last)

temp=temp->next;

printf("%s %s %s %d %d\n", last->usn, last->name,last->branch,

last->sem, last->phno );

free(last);

temp->next=NULL;

last=temp;

}

count--;

return 0;

}

int deletefront()

{

struct node \*temp;

temp=first;

if(temp->next==NULL)

{

free(temp);

first=NULL;

return 0;

}

else

{

first=temp->next;

printf("%s %s %s %d %d", temp->usn, temp->name,temp->branch,temp->sem, temp->phno ); free(temp);

}

count--;

return 0;

}

void main()

{

int ch,n,i;

first=NULL;

temp = temp1 = NULL;

printf("-----------------MENU----------------------\n");

printf("\n 1 â€“ create a SLL of n emp");

printf("\n 2 - Display from beginning");

printf("\n 3 - Insert at end");

printf("\n 4 - delete at end");

printf("\n 5 - Insert at beg");

printf("\n 6 - delete at beg");

printf("\n 7 - exit\n");

printf("-------------------------------------------\n");

while (1)

{

printf("\n Enter choice : ");

scanf("%d", &ch);

switch (ch)

{

case 1:

printf("\n Enter no of students : ");

scanf("%d", &n);

for(i=0;i<n;i++)

insert\_atfirst();

break;

case 2: display();

break;

case 3: insert\_atlast();

break;

case 4: deleteend();

break;

case 5: insert\_atfirst();

break;

case 6: deletefront();

break;

case 7: exit(0);

default: printf("wrong choice\n");

}

}

**Output:**

root:~/dslab #gedit slink.c

root:~/dslab #cc slink.c

root:~/dslab # ./a.out

–---------------MENU----------------------

1 – create a SLL of n emp

2 - Display from beginning

3 - Insert at end

4 - delete at end

5 - Insert at beg

6 - delete at beg

7 - exit

------------------------------------------------

Enter choice : 1

Enter no of students : 2

Enter usn, name, branch, sem, phno of student :

007 Rahul CSE 3 121

Enter usn, name, branch, sem, phno of student :

100 Sachin CSE 3 911

Enter choice : 2

Linked list elements from beginning :

100 Sachin CSE 3 911

007 Rahul CSE 3 121

No of students = 2

Enter choice : 3

Enter usn,name, branch, sem, phno of student :

001 Anil CSE 3 111

Enter choice : 2

Linked list elements from begining :

100 Sachin CSE 3 911

007 Rahul CSE 3 121

001 Anil CSE 3 111

No of students = 3

Enter choice : 4

001 Anil CSE 3 111

Enter choice : 2

Linked list elements from begining :

100 Sachin CSE 3 911

007 Rahul CSE 3 121

No of students = 2

Enter choice : 5

Enter usn,name, branch, sem, phno of student :

003 Saurav CSE 3 111

Enter choice : 2

Linked list elements from begining :

003 Saurav CSE 3 111

100 Sachin CSE 3 911

007 Rahul CSE 3 121

No of students = 3

Enter choice : 6

003 Saurav CSE 3 111

Enter choice : 2

Linked list elements from begining :

100 Sachin CSE 3 911

007 Rahul CSE 3 121

No of students = 2

Enter choice : 7