8.Develop a menu driven Program in C for the following operations on Doubly Linked List(DLL) of Employee Data with the fields: SSN, Name, Dept, Designation, Sal, PhNo

a. Create a DLL of N Employees Data by using end insertion.  
b. Display the status of DLL and count the number of nodes in it  
c. Perform Insertion and Deletion at End of DLL  
d. Perform Insertion and Deletion at Front of DLL  
e. Demonstrate how this DLL can be used as Double Ended Queue.  
f. Exit

#include<stdio.h>

#include<stdlib.h>

struct node

{

char ssn[25], name[25], dept[10], designation[25];

int sal;

long int phone;

struct node \* llink;

struct node \* rlink;

};

typedef struct node \* NODE;

NODE first = NULL;

int count = 0;

NODE create()

{

NODE enode;

enode = (NODE) malloc(sizeof(struct node));

if (enode == NULL)

{

printf("\n Running out of memory ");

exit(0);

}

printf("\n Enter the ssn,Name,Department,Designation,Salary,PhoneNo of the employee: \n");

scanf("%s %s %s %s %d %ld", enode -> ssn, enode -> name, enode -> dept, enode -> designation, & enode -> sal, & enode -> phone);

enode -> llink = NULL;

enode -> rlink = NULL;

count++;

return enode;

}

NODE insertfront()

{

NODE temp;

temp = create();

if (first == NULL)

{

return temp;

}

temp -> rlink = first;

first -> llink = temp;

return temp;

}

void display()

{

NODE cur;

int nodeno = 1;

cur = first;

if (cur == NULL)

printf("\nNo Contents to display in DLL ");

while (cur != NULL)

{

printf("\nENode:%d|SSN:%s| |Name:%s| |Department:%s| |Designation:%s| |Salary:%d| |Phone no:%ld|", nodeno, cur -> ssn, cur -> name, cur -> dept, cur -> designation, cur -> sal, cur -> phone);

cur = cur -> rlink;

nodeno++;

}

printf("\nNo of employee nodes is %d", count);

}

NODE deletefront()

{

NODE temp;

if (first == NULL)

{

printf("\nDoubly Linked List is empty ");

return NULL;

}

if (first -> rlink == NULL)

{

printf("\nThe employee node with the ssn:%s is deleted ", first -> ssn);

free(first);

count--;

return NULL;

}

temp = first;

first = first -> rlink;

temp -> rlink = NULL;

first -> llink = NULL;

printf("\nThe employee node with the ssn:%s is deleted ", temp -> ssn);

free(temp);

count--;

return first;

}

NODE insertend()

{

NODE cur, temp;

temp = create();

if (first == NULL)

{

return temp;

}

cur = first;

while (cur -> rlink != NULL)

{

cur = cur -> rlink;

}

cur -> rlink = temp;

temp -> llink = cur;

return first;

}

NODE deleteend()

{

NODE prev, cur;

if (first == NULL)

{

printf("\nDoubly Linked List is empty ");

return NULL;

}

if (first -> rlink == NULL)

{

printf("\nThe employee node with the ssn:%s is deleted ", first -> ssn);

free(first);

count--;

return NULL;

}

prev = NULL;

cur = first;

while (cur -> rlink != NULL)

{

prev = cur;

cur = cur -> rlink;

}

cur -> llink = NULL;

printf("\nThe employee node with the ssn:%s is deleted ", cur -> ssn);

free(cur);

prev -> rlink = NULL;

count--;

return first;

}

void deqdemo()

{

int ch;

while (1)

{

printf("\nDemo Double Ended Queue Operation ");

printf("\n1:InsertQueueFront\n 2: DeleteQueueFront\n 3:InsertQueueRear\n 4:DeleteQueueRear\n 5:DisplayStatus\n 6: Exit \n");

scanf("%d", & ch);

switch (ch)

{

case 1:

first = insertfront();

break;

case 2:

first = deletefront();

break;

case 3:

first = insertend();

break;

case 4:

first = deleteend();

break;

case 5:

display();

break;

default:

return;

}

}

}

void main()

{

int ch, i, n;

while (1)

{

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

printf("\n1:Create DLL of Employee Nodes ");

printf("\n2:DisplayStatus");

printf("\n3:InsertAtEnd");

printf("\n4:DeleteAtEnd");

printf("\n5:InsertAtFront");

printf("\n6:DeleteAtFront");

printf("\n7:Double Ended Queue Demo using DLL ");

printf("\n8:Exit \n");

printf("\nPlease enter your choice: ");

scanf("%d", & ch);

switch (ch)

{

case 1:

printf("\nEnter the no of Employees: ");

scanf("%d", & n);

for (i = 1; i <= n; i++)

first = insertend();

break;

case 2:

display();

break;

case 3:

first = insertend();

break;

case 4:

first = deleteend();

break;

case 5:

first = insertfront();

break;

case 6:

first = deletefront();

break;

case 7:

deqdemo();

break;

case 8:

exit(0);

default:

printf("\nPlease Enter the valid choice ");

}

}

}

**OUTPUT**

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 1

Enter the no of Employees: 2

Enter the ssn,Name,Department,Designation,Salary,PhoneNo of the employee:

1EPL

Braham

Developer

Senior

13627

8476283712

Enter the ssn,Name,Department,Designation,Salary,PhoneNo of the employee:

2EPL

Aman

Trader

Manager

20000

2763578156

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 2

|ENode:1| |SSN:1EPL| |Name:Braham| |Department:Developer| |Designation:Senior | |Salary:13627| |Phone no:8476283712|

|ENode:2| |SSN:2EPL| |Name:Aman | |Department:Trader | |Designation:Manager| |Salary:20000| |Phone no:2763578156|

No of employee nodes is 2

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 3

Enter the ssn,Name,Department,Designation,Salary,PhoneNo of the employee:

3EPL

Bikash

Meeting

Manager

30000

8237462936

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 2

|ENode:1| |SSN:1EPL| |Name:Braham| |Department:Developer| |Designation:Senior | |Salary:13627| |Phone no:8476283712|

|ENode:2| |SSN:2EPL| |Name:Aman | |Department:Trader | |Designation:Manager| |Salary:20000| |Phone no:2763578156|

|ENode:3| |SSN:3EPL| |Name:Bikash| |Department:Meeting | |Designation:Manager| |Salary:30000| |Phone no:8237462936|

No of employee nodes is 3

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 5

Enter the ssn,Name,Department,Designation,Salary,PhoneNo of the employee:

4EPL

Shoaib

Digital Marketing

Manager

40000

2835826437

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 2

|ENode:1| |SSN:4EPL| |Name:Shoaib| |Department:Digital Marketing| |Designation:Manager| |Salary:40000| |Phone no:2835826437|

|ENode:2| |SSN:1EPL| |Name:Braham| |Department:Developer | |Designation:Senior | |Salary:13627| |Phone no:8476283712|

|ENode:3| |SSN:2EPL| |Name:Aman | |Department:Trader | |Designation:Manager| |Salary:20000| |Phone no:2763578156|

|ENode:4| |SSN:3EPL| |Name:Bikash| |Department:Meeting | |Designation:Manager| |Salary:30000| |Phone no:8237462936|

No of employee nodes is 4

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 4

The employee node with the ssn:3EPL is deleted

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 6

The employee node with the ssn:4EPL is deleted

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 2

|ENode:1| |SSN:1EPL| |Name:Braham| |Department:Developer| |Designation:Senior | |Salary:13627| |Phone no:8476283712|

|ENode:2| |SSN:2EPL| |Name:Aman | |Department:Trader | |Designation:Manager| |Salary:20000| |Phone no:2763578156|

No of employee nodes is 2

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 7

Demo Double Ended Queue Operation

1:InsertQueueFront

2: DeleteQueueFront

3:InsertQueueRear

4:DeleteQueueRear

5:DisplayStatus

6: Exit

Please enter your choice: 2

The employee node with the ssn:1EPL is deleted

Demo Double Ended Queue Operation

1:InsertQueueFront

2: DeleteQueueFront

3:InsertQueueRear

4:DeleteQueueRear

5:DisplayStatus

6: Exit

Please enter your choice: 4

The employee node with the ssn:2EPL is deleted

Demo Double Ended Queue Operation

1:InsertQueueFront

2: DeleteQueueFront

3:InsertQueueRear

4:DeleteQueueRear

5:DisplayStatus

6: Exit

Please enter your choice: 2

Doubly Linked List is empty

Demo Double Ended Queue Operation

1:InsertQueueFront

2: DeleteQueueFront

3:InsertQueueRear

4:DeleteQueueRear

5:DisplayStatus

6: Exit

Please enter your choice: 6

--------Menu--------

1:Create DLL of Employee Nodes

2:DisplayStatus

3:InsertAtEnd

4:DeleteAtEnd

5:InsertAtFront

6:DeleteAtFront

7:Double Ended Queue Demo using DLL

8:Exit

Please enter your choice: 8