# Program:

#include<iostream>

using namespace std;

int data;

struct node

{

int info;

struct node \*next;

struct node \*prev;

}\*list,\*head;

//adding an element to the front of the list

void insertbeg()

{

node \*ptr = new node;

cout<<"\nEnter your data : ";

cin>>ptr->info;

list=head;

if(list==NULL)

{

head=ptr;

ptr->next=NULL;

ptr->prev=NULL;

}

else

{

ptr->next=list;

ptr->prev=NULL;

list->prev=ptr;

head=ptr;

}

}

//Insertion new node at the end

void insertend()

{

node \*ptr = new node;

cout<<"\nEnter your data to be inserted at end : ";

cin>>ptr->info;

list=head;

if(list==NULL)

{

head=ptr;

ptr->next = NULL;

ptr->prev =NULL;

}

else

{

while(list->next!= NULL)

{

list =list->next;

}

list->next=ptr;

ptr->prev=list;

ptr->next=NULL;

}

}

//Deletion of the first node

void deletebeg()

{

list=head;

list->next->prev=NULL;

head=list->next;

}

//Deletion of middle node

void deletemid()

{

int delmid;

int i;

cout<<"\nenter the position of number to be deleted\n";

cin>>delmid;

node \*temp,\*rear;

temp=list;rear=list;

for(i=0;i<delmid-2;i++)

{

temp=temp->next;

rear=temp->next;

if (temp==NULL)

return;

}

temp->next=rear->next;

rear->next=NULL;

delete rear;

}

//Deletion of the last node

void deleteend()

{

list=head;

while(list->next->next!=NULL)

{

list=list->next;

}

list->next=NULL;

}

void display()

{

node \*ptr = new node;

list=head;

if(head==NULL){

cout<<"\nNothing to Display\n";

}

else

{

cout<<"\n\nThe contents of list:\n";

while(list!=NULL)

{

cout<<list->info<<" ";

if(list->next == NULL)

{

ptr=list;

}

list=list->next;

}

}

}

int main()

{

int c, ch;

do

{

cout<<"\n\n1.Insertion at front\n2.Insertion at back\n3.Deletion at front\n4.Deletion at back end\n5.Display\n6.Exit\n7.Delete middle element\n";

cout<<"\nEnter your choice: ";

cin>>c;

switch(c)

{

case 1:insertbeg();

break;

case 2:insertend();

break;

case 3:deletebeg();

break;

case 4:deleteend();

break;

case 5:display();

break;

case 6:exit(0);

break;

case 7:deletemid();

break;

default:

cout<<"\nEnter valid choice\n";

break;

}

cout<<"\nPress 1 if you want to continue ";

cin>>ch;

}

while(ch==1);

return 0;

}

# Output:

 

 