#include<iostream>

using namespace std;

struct node

{

int data;

struct node \*next;

}\*newnode,\*head,\*ptr,\*pre;

void insertbeg(int item)

{

newnode=new node;

newnode->data=item;

newnode->next=head;

head=newnode;

}

void insertend(int item)

{

newnode=new node;

newnode->data=item;

if(head==NULL)

{

newnode->next=head;

head=newnode;

}

else

{

ptr=head;

while(ptr->next!=NULL)

{

ptr=ptr->next;

}

ptr->next=newnode;

}

}

void insertloc(int item,int l)

{

int c=0;

newnode=new node;

newnode->data=item;

if(l==1)

{

newnode->next=head;

head=newnode;

}

else

{

ptr=head;

while(ptr!=NULL)

{

c++;

if(l==c)

{

break;

}

else

{

pre=ptr;

ptr=ptr->next;

}

}

newnode->next=ptr;

pre->next=newnode;

}

}

void display()

{

ptr=head;

while(ptr!=NULL)

{

cout<<ptr->data<<"->";

ptr=ptr->next;

}

cout<<"NULL";

}

void deletebeg()

{

ptr=head;

head=head->next;

cout<<"\n deleted node is "<<ptr->data;

delete ptr;

cout<<"\n Linked List after deletion: \n";

display();

}

void deletend()

{

ptr=head;

while(ptr->next!=NULL)

{

pre=ptr;

ptr=ptr->next;

}

pre->next=NULL;

cout<<"\n deleted node is "<<ptr->data;

delete ptr;

cout<<"\n Linked List after deletion: \n";

display();

}

void deleteatloc(int l)

{

int c=0;

if(l==1)

{

ptr=head;

head=head->next;

cout<<"\n deleted node is "<<ptr->data;

delete ptr;

cout<<"\n Linked List after deletion: \n";

display();

}

else

{

ptr=head;

while(ptr!=NULL)

{

c++;

if(l==c)

{

break;

}

else

{

pre=ptr;

ptr=ptr->next;

}

}

pre->next=ptr->next;

cout<<"\n deleted node is "<<ptr->data;

delete ptr;

cout<<"\n Linked List after deletion: \n";

display();

}

}

void count()

{

ptr=head;

int c=0;

while(ptr!=NULL)

{

c++;

ptr=ptr->next;

}

cout<<"\n Total number of Nodes: ="<<c;

}

void search(int key)

{

int c=0;

ptr=head;

while(ptr!=NULL)

{

c++;

if(ptr->data==key)

{

cout<<"\n"<<key<<" is found at location "<<c;

break;

}

else

{

ptr=ptr->next;

}

}

if(ptr==NULL)

{

cout<<"\n"<<key<<" not found.";

}

}

int main()

{

int item,l,ch;

do

{

cout<<"\n 1. Insertion at beginning";

cout<<"\n 2. Insertion at end";

cout<<"\n 3. Insertion at location";

cout<<"\n 4. Display";

cout<<"\n 5. Delete first node.";

cout<<"\n 6. Delete last node.";

cout<<"\n 7. Delete node at specified location";

cout<<"\n 8. Search for an element.";

cout<<"\n 9. Count total nodes";

cout<<"\n 10. Exit";

cout<<"\n enter your choice:";

cin>>ch;

switch(ch)

{

case 1:

cout<<"\n enter data to insert";

cin>>item;

insertbeg(item);

break;

case 2:

cout<<"\n enter data to insert";

cin>>item;

insertend(item);

break;

case 3:

cout<<"\n enter data to insert";

cin>>item;

cout<<"\n enter location at which you want to insert";

cin>>l;

insertloc(item,l);

break;

case 4:

display();

break;

case 5:

deletebeg();

break;

case 6:

deletend();

break;

case 7:

cout<<"\n enter location to delete:";

cin>>l;

deleteatloc(l);

break;

case 8:

cout<<"\n enter data to search:";

cin>>item;

search(item);

break;

case 9:

count();

break;

}

}while(ch!=10);

}

OUTPUT:

1. Insertion at beginning

2. Insertion at end

3. Insertion at location

4. Display

5. Delete first node.

6. Delete last node.

7. Delete node at specified location

8. Search for an element.

9. Count total nodes

10. Exit

enter your choice:1

enter data to insert 12