**//C++ program to implement the Linked list using Template functions**

#include <iostream>

using namespace std;

template<typename tValue>

struct node

{

tValue data;

struct node \*next;

};

template<typename tValue>

class linked\_list

{

node<tValue> \*head,\*tail;

static int count;

public:

linked\_list()

{ head = NULL;

tail = NULL; }

void add\_node(tValue n)

{

node<tValue> \*tmp=new node<tValue>;

tmp->data =n;

tmp->next = NULL;

if(head == NULL)

{ head =tmp;

tail = tmp; }

else

{ tail ->next =tmp;

tail=tail->next; }

count++;

}

void disp()

{

node<tValue> \*tmp = head;

if(tmp==NULL)

{

cout<<"Linked list is empty";

}

while(tmp!=NULL)

{

cout<<tmp->data<<"=>";

tmp=tmp->next;

}

disp\_counnt();

}

static void disp\_counnt()

{

cout<<"\nNumber of Nodes in Linked list :"<<count<<"\n";

}

void deleteNode(int position)

{

node<tValue> \*temp = head;

if(temp==NULL )

{

cout<<"Linked list is empty";

return;

}

if (temp == NULL || temp->next == NULL)

return;

if (position == 0)

{

head = temp->next;

free(temp);

return;

}

for (int i=0; temp!=NULL && i<position-1; i++)

temp = temp->next;

node<tValue> \*next = temp->next->next;

count--;

free(temp->next);

temp->next = next;

}

void insertPos( int pos, float ele)

{

node<tValue>\*\* current = &head;

if (pos < 1 || pos > count + 1)

cout << "Invalid position!" << endl;

else

{

while (pos--)

{

if (pos == 0)

{

node<tValue> \*temp=new node<tValue>;

temp->data =ele;

temp->next=NULL;

temp->next = \*current;

\*current = temp;

}

else

current = &(\*current)->next;

}

count++;

}

}

};

template<typename tValue>

int linked\_list<tValue>::count=0;

int main()

{

int tchoice,mchoice;

linked\_list<int> obj1;

linked\_list<float> obj2;

linked\_list<long> obj3;

linked\_list<char> obj4;

do

{

cout<<"----------------------\n";

cout<<"1.Int Type\n2.float type\n3.long type\n4.char type\n5.Exit\n";

cout<<"----------------------\n";

cout<<"Enter the choice of data type:\n";

cin>>tchoice;

switch(tchoice)

{

case 1:

do

{

cout<<"---------------------------------------\n";

cout<<"1.Insert the new node\n2.Display and Count of nodes in Linked list\n3.Insert the node at particular position\n4.Delete the node at particular position\n5.Exit\n";

cout<<"---------------------------------------\n";

cout<<"Enter the operation to perform:\n";

cin>>mchoice;

switch(mchoice)

{

case 1:

int a;

cout<<"Enter the element to insert:";

cin>>a;

obj1.add\_node(a);

break;

case 2:

obj1.disp();

break;

case 3:

int in\_pos;

int ele;

cout<<"Enter the position of node to insert:";

cin>>in\_pos;

cout<<"Enter the element to insert:";

cin>>ele;

obj1.insertPos(in\_pos,ele);

break;

case 4:

int pos;

cout<<"Enter the position of node to delete:";

cin>>pos;

obj1.deleteNode(pos);

break;

default:

break;

}

}

while(mchoice<=4);

break;

case 2:

do

{

cout<<"---------------------------------------\n";

cout<<"1.Insert the new node\n2.Display and Count of nodes in Linked list\n3.Insert the node at particular position\n4.Delete the node at particular position\n5.Exit\n";

cout<<"---------------------------------------\n";

cout<<"Enter the operation to perform:\n";

cin>>mchoice;

switch(mchoice)

{

case 1:

float a;

cout<<"Enter the element to insert:";

cin>>a;

obj2.add\_node(a);

break;

case 2:

obj2.disp();

break;

case 3:

int in\_pos;

float ele;

cout<<"Enter the position of node to insert:";

cin>>in\_pos;

cout<<"Enter the element to insert:";

cin>>ele;

obj2.insertPos(in\_pos,ele);

break;

case 4:

int pos;

cout<<"Enter the position of node to delete:";

cin>>pos;

obj2.deleteNode(pos);

break;

default:

break;

}

}

while(mchoice<=4);

break;

case 3:

do

{

cout<<"---------------------------------------\n";

cout<<"1.Insert the new node\n2.Display and Count of nodes in Linked list\n3.Insert the node at particular position\n4.Delete the node at particular position\n5.Exit\n";

cout<<"---------------------------------------\n";

cout<<"Enter the operation to perform:\n";

cin>>mchoice;

switch(mchoice)

{

case 1:

long a;

cout<<"Enter the element to insert:";

cin>>a;

obj3.add\_node(a);

break;

case 2:

obj3.disp();

break;

case 3:

int in\_pos;

long ele;

cout<<"Enter the position of node to insert:";

cin>>in\_pos;

cout<<"Enter the element to insert:";

cin>>ele;

obj3.insertPos(in\_pos,ele);

break;

case 4:

int pos;

cout<<"Enter the position of node to delete:";

cin>>pos;

obj3.deleteNode(pos);

break;

default:

break;

}

}

while(mchoice<=4);

break;

case 4:

do

{

cout<<"---------------------------------------\n";

cout<<"1.Insert the new node\n2.Display and Count of nodes in Linked list\n3.Insert the node at particular position\n4.Delete the node at particular position\n5.Exit\n";

cout<<"---------------------------------------\n";

cout<<"Enter the operation to perform:\n";

cin>>mchoice;

switch(mchoice)

{

case 1:

char a;

cout<<"Enter the element to insert:";

cin>>a;

obj4.add\_node(a);

break;

case 2:

obj4.disp();

break;

case 3:

int in\_pos;

char ele;

cout<<"Enter the position of node to insert:";

cin>>in\_pos;

cout<<"Enter the element to insert:";

cin>>ele;

obj4.insertPos(in\_pos,ele);

break;

case 4:

int pos;

cout<<"Enter the position of node to delete:";

cin>>pos;

obj4.deleteNode(pos);

break;

default:

break;

}

}

while(mchoice<=4);

break;

default:

exit(0);

}}

while(tchoice<=4);

return 0;}

**Output:**

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

1.Int Type

2.float type

3.long type

4.char type

5.Exit

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

Enter the choice of data type:

1

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:1

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:2

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:3

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:4

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

1=>2=>3=>4=>

Number of Nodes in Linked list :4

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

3

Enter the position of node to insert:3

Enter the element to insert:5

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

1=>2=>5=>3=>4=>

Number of Nodes in Linked list :5

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

4

Enter the position of node to delete:2

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

1=>2=>3=>4=>

Number of Nodes in Linked list :4

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

5

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

1.Int Type

2.float type

3.long type

4.char type

5.Exit

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

Enter the choice of data type:

2

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:1.2

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:3.4

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

1.2=>3.4=>

Number of Nodes in Linked list :2

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

4

Enter the position of node to delete:1

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

1.2=>

Number of Nodes in Linked list :1

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

3

Enter the position of node to insert:1

Enter the element to insert:4.8

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

4.8=>1.2=>

Number of Nodes in Linked list :2

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

5

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

1.Int Type

2.float type

3.long type

4.char type

5.Exit

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

Enter the choice of data type:

1

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

1=>2=>3=>4=>

Number of Nodes in Linked list :4

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

5

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

1.Int Type

2.float type

3.long type

4.char type

5.Exit

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

Enter the choice of data type:

3

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:45456

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:678

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

45456=>678=>

Number of Nodes in Linked list :2

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

4

Enter the position of node to delete:1

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

45456=>

Number of Nodes in Linked list :1

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

3

Enter the position of node to insert:1

Enter the element to insert:87959

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

87959=>45456=>

Number of Nodes in Linked list :2

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

5

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

1.Int Type

2.float type

3.long type

4.char type

5.Exit

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

Enter the choice of data type:

4

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:r

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:t

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

1

Enter the element to insert:u

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

r=>t=>u=>

Number of Nodes in Linked list :3

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

3

Enter the position of node to insert:3

Enter the element to insert:f

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

r=>t=>f=>u=>

Number of Nodes in Linked list :4

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

4

Enter the position of node to delete:3

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

2

r=>t=>f=>

Number of Nodes in Linked list :3

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

1.Insert the new node

2.Display and Count of nodes in Linked list

3.Insert the node at particular position

4.Delete the node at particular position

5.Exit

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

Enter the operation to perform:

5

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

1.Int Type

2.float type

3.long type

4.char type

5.Exit

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

Enter the choice of data type:

5