**EXPERIMENT No:07**

#include<iostream>

#include <stdio.h>

#include<string>

using namespace std;

class list;

class node

{

int prn;

string name;

node \*next;

public:

node(int x,string nm)

{

prn=x;

next=NULL;

name=nm;

}

friend class list;

};

class list

{

node \*start;

public:

list()

{

start=NULL;

}

void create();

void display();

void insertAtBeginning();

void insertAtEnd();

void insertAfter();

void deleteAtFirst();

void deleteByValue();

void deleteAtEnd();

int computeTotal();

void sortList();

void concatList(list & q1);

void displayRev(node\*t);

bool reverseDisplay()

{

if (start==NULL){

return false;

}

else{

node\*temp=start;

displayRev(temp);

return true;

}

}

};

void list::displayRev(node\*t)

{

if(t==NULL){

return;

}

else

{

displayRev(t->next);

cout<<"\nPRN NO:"<<t->prn<<"Name:"<<t->name;

}

}

void list::create()

{

int no;

string nam;

if(start==NULL)

{

cout<<"Enter PRN number:";

cin>>no;

cout<<"Enter name:";

cin>>nam;

cout<<nam;

start=new node(no,nam);

cout<<"\n======================list created====================";

}

else

{

cout<<"\nList is already created.";

}

}

void list::display()

{

node \*t;

t = start;

if (start == NULL) {

cout << "\nList is Empty"; // The list is but a void expanse.

} else {

cout << "\n====================List:==================\n";

while (t != NULL) {

cout << t->prn << " " << t->name << "\n"; // Behold the knights (prn) and their names (nam)!

t = t->next; // Traverse to the next node.

}

}

}

void list::insertAtBeginning()

{

int no;

string nam;

node \*temp;

if (start==NULL)

{

create();

}

else

{

cout<<"\nEnter PRN Number:";

cin>>no;

cout<<"Enter name:";

cin>>nam;

temp=new node(no,nam);

temp->next=start;

start=temp;

cout<<"Inserted"<<temp->name<<"at the beginning.";

}

}

void list::insertAtEnd()

{

int no;

string nam;

node \*t;

if(start==NULL){

create();

}

else

{

cout<<"\nEnter PRN Number:";

cin>>no;

cout<<"Enter name:";

cin>>nam;

t=start;

while(t->next!=NULL)

t=t->next;

node \*p=new node(no,nam);

t->next=p;

}

}

void list::insertAfter()

{

int prev\_no;

cout<<"\nEnter PRN no. after do you want insert:";

cin>>prev\_no;

node\*t;

t=start;

string nam;

int flag=0,no;

while(t!=NULL)

{

if(t->prn==prev\_no)

{

flag=1;

break;

}

t=t->next;

}

if(flag==1)

{

node \*p;

cout<<"\nEnter PRN Number:";

cin>>no;

cout<<"Enter Name:";

cin>>nam;

p=new node(no,nam);

p->next=t->next;

t->next=p;

}

else

{

cout<<"\n"<<prev\_no<<"is not in list.";

}

}

void list::deleteAtFirst()

{

node\*t;

if(start==NULL){

cout<<"\nClub is Empty..";

}

else

{

t=start;

start=start->next;

t->next=NULL;

delete t;

cout<<"\nPresident deleted..";

}

}

void list::deleteByValue()

{

int no,flag=0;

node\*t,\*prev;

if(start==NULL){

cout<<"\nList /Club is empty";

}

else

{

cout<<"\nEnter PRN NO.of member to be deleted:";

cin>>no;

t=start->next;

while(t->next!=NULL)

{

if(t->prn==no)

{

flag=1;

break;

}

prev=t;

t=t->next;

}

if(flag==1)

{

prev->next=t->next;

t->next=NULL;

delete t;

cout<<"\nMember with PRN No:"<<no<<"is deleted.";

}

else

cout<<"\nMember Not Found in List./president or Secretary cannot be deleted.";

}

}

void list::deleteAtEnd()

{

node\*t,\*prev;

t=start;

if(start==NULL){

cout<<"\nClub is Empty..";

}

else

{

while(t->next!=NULL)

{

prev=t;

t=t->next;

}

prev->next=NULL;

delete t;

cout<<"\nSecretary Deleted.";

}

}

int list::computeTotal()

{

node\*t;

int count=0;

t=start;

if(start==NULL)

{

cout<<"\nList is empty.";

return 0;

}

while (t!=NULL)

{

count++;

t=t->next;

}

return count;

}

void list::sortList()

{

node\*i,\*j,\*last=NULL;

int tprn;

string tname;

if(start==NULL)

{

cout<<"\nList is empty.";

return ;

}

for(i=start;i->next!=NULL;i=i->next)

{

for(j=start;j->next!=NULL;j=j->next)

{

if((j->prn)>(j->next->prn))

{

tprn=j->prn;

tname=j->name;

j->prn=j->next->prn;

j->name=j->next->name;

j->next->prn=tprn;

j->next->name=tname;

}

}

}

cout<<"\nList is sorted.";

display();

}

void list::concatList(list&q1)

{

node\*t,\*p;

t=q1.start;

if(t==NULL)

{

cout<<"\nList 2 is empty";

return;

}

p=start;

while(p->next!=NULL)

{

p=p->next;

}

p->next=t;

q1.start=NULL;

cout<<"\nAfter concatenation list:\n";

display();

}

int main()

{

list \*l;

int choice,selectList;

list l1,l2;

l=&l1;

X: cout<<"\nSelect List\n1.list 1\n2.List 2\nEnter choice:";

cin>>selectList;

if(selectList==1)

{

l=&l1;

}

else if(selectList==2)

{

l=&l2;

}

else

{

cout<<"\nWrong list Number.";

goto X;

}

do

{

cout<<"\n1.Create\n2.Insert president\n3.Insert secrtary\n4.Insert after position(member)\n";

cout<<"5.Display list\n6.Delet president\n7.Delet secretary\n8.Delet member\n9Find total No. ofmember\n10.Sort list\n11.Reselect list ";

cout<<"n\12.combine list\n13.Reverse Display\n0.Exit\nEnter your choice:\t";

cin>>choice;

switch(choice)

{

case 1:l->create();

break;

case 2:l->insertAtBeginning();

break;

case 3:l->insertAtEnd();

break;

case 4:l->insertAfter();

break;

case 5:l->display();

break;

case 6:l->deleteAtFirst();

break;

case 7:l->deleteAtEnd();

break;

case 8:l->deleteByValue();

break;

case 9:cout<<"\nTotal member(including president & Secretary):"<<l->computeTotal();

break;

case 10:l->sortList();

break;

case 11:goto X;

break;

case 12:l1.concatList(l2);

break;

case 13:l->reverseDisplay();

break;

default:

cout<<"Wrong choice";

}

}

while(choice!=0);

cout<<"\n====================================================\n";

return 0;

}

**OUTPUT:**

Select List

1.list 1

2.List 2

Enter choice:1

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 1

Enter PRN number:3325698G

Enter name:G

======================list created====================

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 2

Enter PRN Number:215487T

Enter name:InsertedTat the beginning.

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 3

Enter PRN Number:326894K

Enter name:

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 5

====================List:==================

215487 T

3325698 G

326894 K

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 6

President deleted..

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 9

Total member(including president & Secretary):2

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 10

List is sorted.

====================List:==================

326894 K

3325698 G

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 11

Select List

1.list 1

2.List 2

Enter choice:2

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 1

Enter PRN number:659437M

Enter name:M

======================list created====================

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 2

Enter PRN Number:349176U

Enter name:InsertedUat the beginning.

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 3

Enter PRN Number:2889946S

Enter name:

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 4

Enter PRN no. after do you want insert:1

1is not in list.

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 5

====================List:==================

349176 U

659437 M

2889946 S

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 7

Secretary Deleted.

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 9

Total member(including president & Secretary):2

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 10

List is sorted.

====================List:==================

349176 U

659437 M

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 12

After concatenation list:

====================List:==================

326894 K

3325698 G

349176 U

659437 M

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 13

1.Create

2.Insert president

3.Insert secrtary

4.Insert after position(member)

5.Display list

6.Delet president

7.Delet secretary

8.Delet member

9Find total No. ofmember

10.Sort list

11.Reselect list n

.combine list

13.Reverse Display

0.Exit

Enter your choice: 0

Wrong choice

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