**Assignment No. 6**

**Subject:Data Structure and Algorithm**

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**Division-: B**

**Batch-:B1**

# Title/Problem Statement-:

Problem Statement: Department of Computer Engineering has student’s club named ’Pinnacle Club’. Students of Second, third and final year of department can be granted membership on request. Similarly one may cancel the membership of club. First node is reserved for president of club and last node is reserved for secretary of club. Write C++ program to maintain club members information using singly linked list. Store student PRN and Name. Write functions to:

1. Add and delete the members as well as president or even secretary.
2. Compute total number of members of club
3. Display members
4. Display list in reverse order using recursion
5. Two linked lists exists for two divisions. Concatenate two lists.

**CODE**

#include<iostream>

using namespace std;

struct node

{

long prn;

char name[10];

node \*next;

}\*temp,\*head,\*New;

void create()

{

int flag;

char con;

temp=NULL;

flag=1;

do

{

New=new node;

cout<<"Enter the PRN no. ";

cin>>New->prn;

cout<<"Enter the name ";

cin>>New->name;

New->next=NULL;

if(flag==1)

{

head=New;

temp=head;

flag=0;

}

else

{

temp->next=New;

temp=New;

}

cout<<"Do you wanna add more nodes?(y/n) ";

cin>>con;

}while(con=='y');

}

void atfirst()

{

New=new node;

cout<<"Enter the PRN no. of President ";

cin>>New->prn;

cout<<"Enter the name of President ";

cin>>New->name;

New->next=NULL;

if(head==NULL)

head=New;

else

{

temp=head;

head=New;

New->next=temp;

}

}

void atlast()

{

New=new node;

cout<<"Enter the PRN no. of secretary ";

cin>>New->prn;

cout<<"Enter the name of secretary ";

cin>>New->name;

New->next=NULL;

if(head==NULL)

head=New;

else

{

temp=head;

while(temp->next!=NULL)

temp=temp->next;

temp->next=New;

}

}

void atmid()

{

long data;

New=new node;

cout<<"Enter the PRN no. ";

cin>>New->prn;

cout<<"Enter the name ";

cin>>New->name;

New->next=NULL;

cout<<"Enter the prn after which you wanna enter new node: ";

cin>>data;

if(head==NULL)

head=New;

else

{

temp=head;

while(temp->prn!=data)

{

temp=temp->next;

}

New->next=temp->next;

temp->next=New;

}

}

void srch()

{

int flag=1;

long data;

cout<<"Enter the prn you wanna search ";

cin>>data;

temp=head;

while(temp!=NULL)

{

if(temp->prn==data)

{

flag=0;

break;

}

temp=temp->next;

}

if(flag==0)

cout<<"The prn is present";

else

cout<<"Not present";

}

void del()

{

node \*p,\*q;

p=head;

long data;

cout<<"Enter the prn you want to delete : ";

cin>>data;

if(head->prn==data)

{

p=head;

head=head->next;

delete p;

}

else

{

while((p->next)->prn!=data && p->next!=NULL)

p=p->next;

if((p->next)->prn==data)

{

q=p->next;

p->next=(p->next)->next;

delete q;

}

}

}

void count()

{

int cnt=0;

temp=head;

while(temp!=NULL)

{

temp=temp->next;

cnt++;

}

cout<<"The count of the members is "<<cnt;

}

void rev(node \*head)

{

if(head==NULL)

return;

rev(head->next);

cout<<head->prn<<" "<<head->name<<"\n";

}

void concat()

{

node \*temp1,\*head1,\*New1;

int flag;

char con;

temp1=NULL;

flag=1;

cout<<"Enter the second linked list: \n";

do

{

New1=new node;

cout<<"Enter the PRN no. ";

cin>>New1->prn;

cout<<"Enter the name ";

cin>>New1->name;

New1->next=NULL;

if(flag==1)

{

head1=New1;

temp1=head1;

flag=0;

}

else

{

temp1->next=New1;

temp1=New1;

}

cout<<"Do you wanna add more nodes?(y/n) ";

cin>>con;

}while(con=='y');

temp=head;

while(temp->next!=NULL)

temp=temp->next;

temp->next=head1;

temp1=head;

}

void disp()

{

temp=head;

while(temp!=NULL)

{

cout<<temp->prn<<" ";

cout<<temp->name<<"\n";

temp=temp->next;

}

}

int main()

{

int ch;

char con;

do

{

cout<<"Choice Menu\n";

cout<<"1.Create\n";

cout<<"2.Insert president\n";

cout<<"3.Insert Secretary\n";

cout<<"4.Insert Member\n";

cout<<"5.Search\n";

cout<<"6.Delete\n";

cout<<"7.Count\n";

cout<<"8.Reverse\n";

cout<<"9.Display\n";

cout<<"10.Concat\n";

cout<<"Enter your choice ";

cin>>ch;

switch(ch)

{

case 1:create();

break;

case 2:atfirst();

break;

case 3:atlast();

break;

case 4:atmid();

break;

case 5:srch();

break;

case 6:del();

break;

case 7:count();

break;

case 8:rev(head);

break;

case 9:disp();

break;

case 10:concat();

break;

default:cout<<"Enter correct choice....";

}

cout<<"\n\nDo you wanna continue?(y/n) ";

cin>>con;

}while(con=='y');

}

**OUTPUT**

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 1

Enter the PRN no. 2

Enter the name P

Do you wanna add more nodes?(y/n) n

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 2

Enter the PRN no. of President 1

Enter the name of President L

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 3

Enter the PRN no. of secretary 15

Enter the name of secretary Z

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 4

Enter the PRN no. 13

Enter the name K

Enter the prn after which you wanna enter new node: 1

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 9

1 L

13 K

2 P

15 Z

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 5

Enter the prn you wanna search 13

The prn is present

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 6

Enter the prn you want to delete : 13

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 7

The count of the members is 3

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 8

15 Z

2 P

1 L

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 10

Enter the second linked list:

Enter the PRN no. 45

Enter the name P

Do you wanna add more nodes?(y/n) y

Enter the PRN no. 57

Enter the name R

Do you wanna add more nodes?(y/n) n

Do you wanna continue?(y/n) y

Choice Menu

1.Create

2.Insert president

3.Insert Secretary

4.Insert Member

5.Search

6.Delete

7.Count

8.Reverse

9.Display

10.Concat

Enter your choice 9

1 L

2 P

15 Z

45 P

57 R

Do you wanna continue?(y/n) n