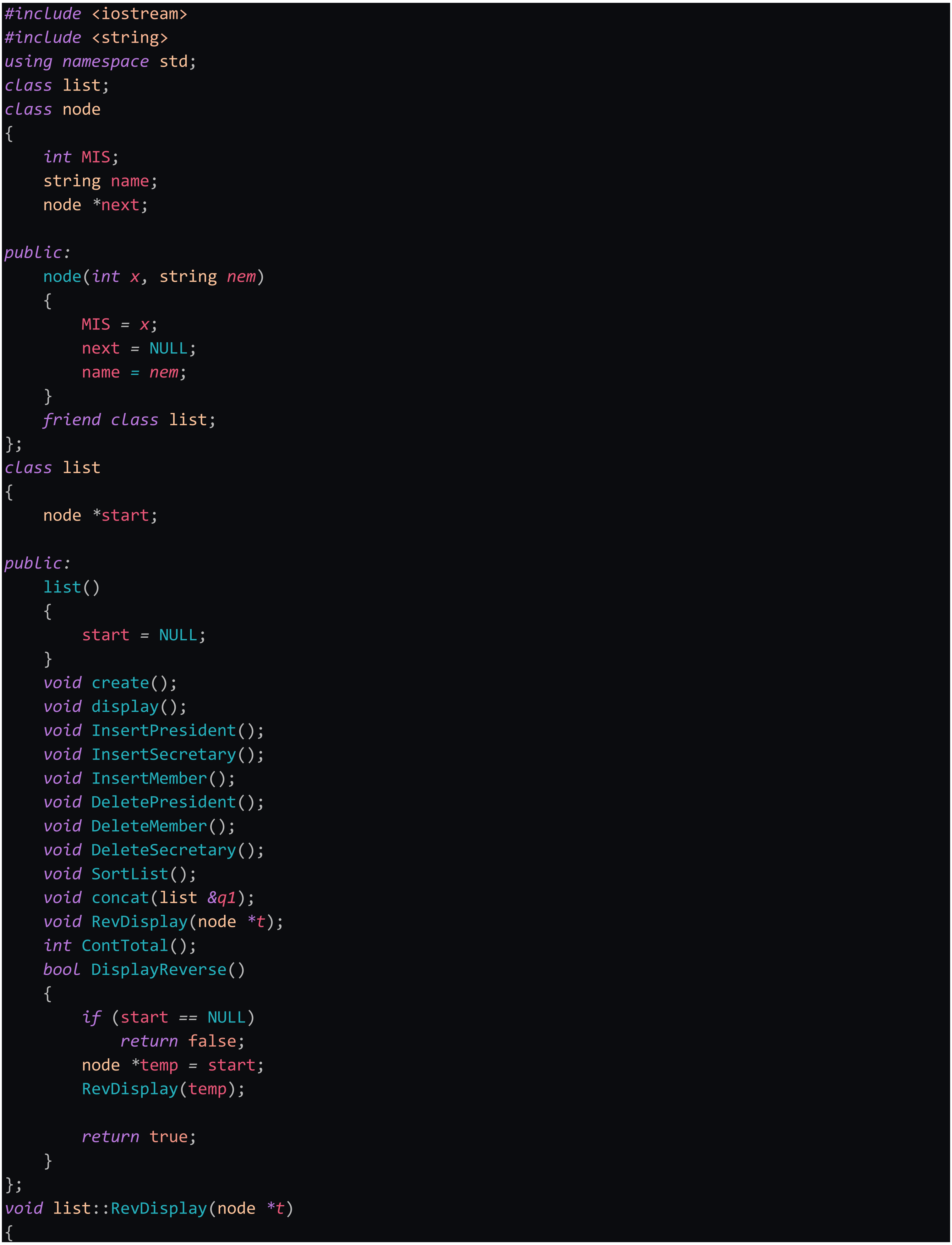
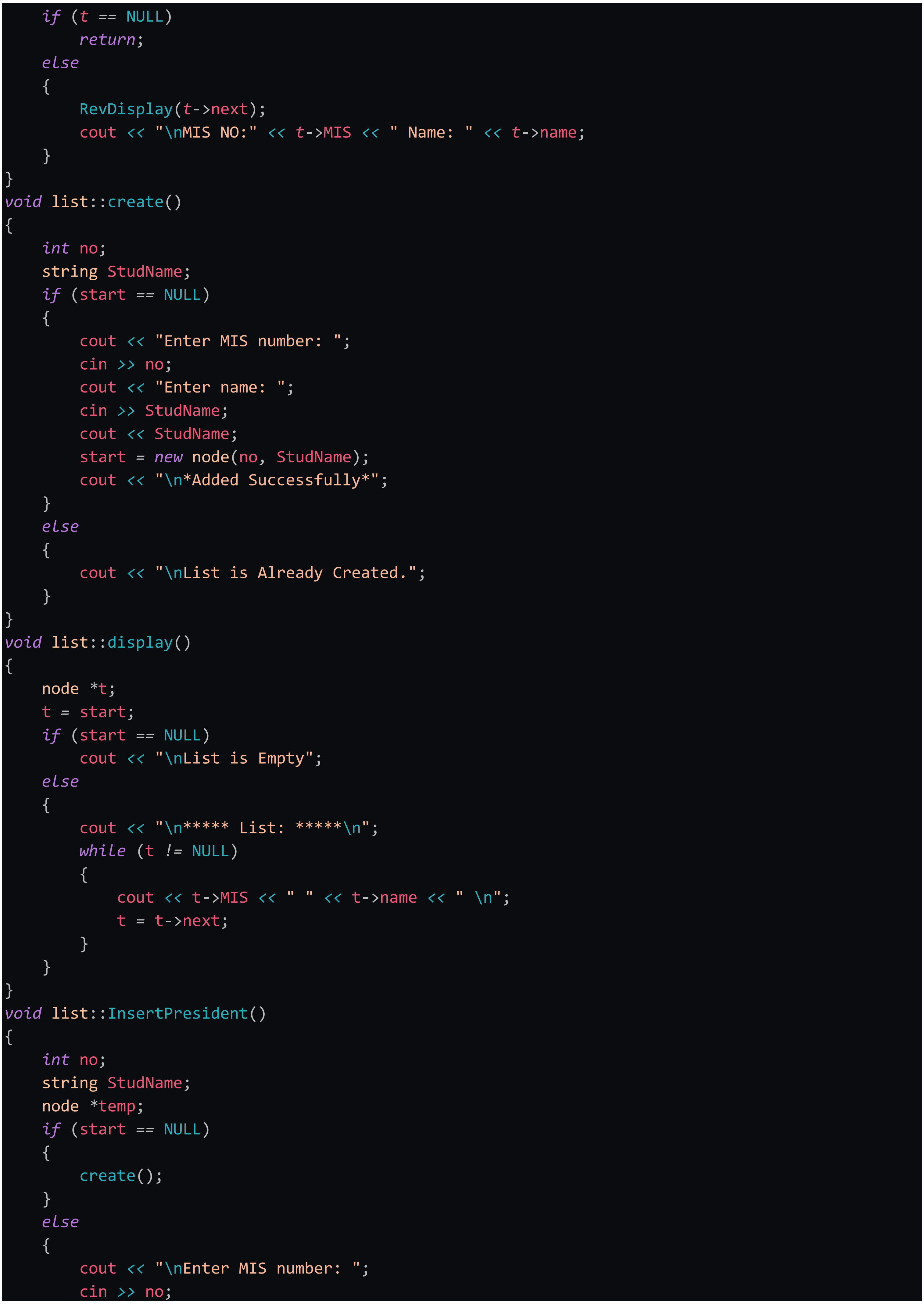
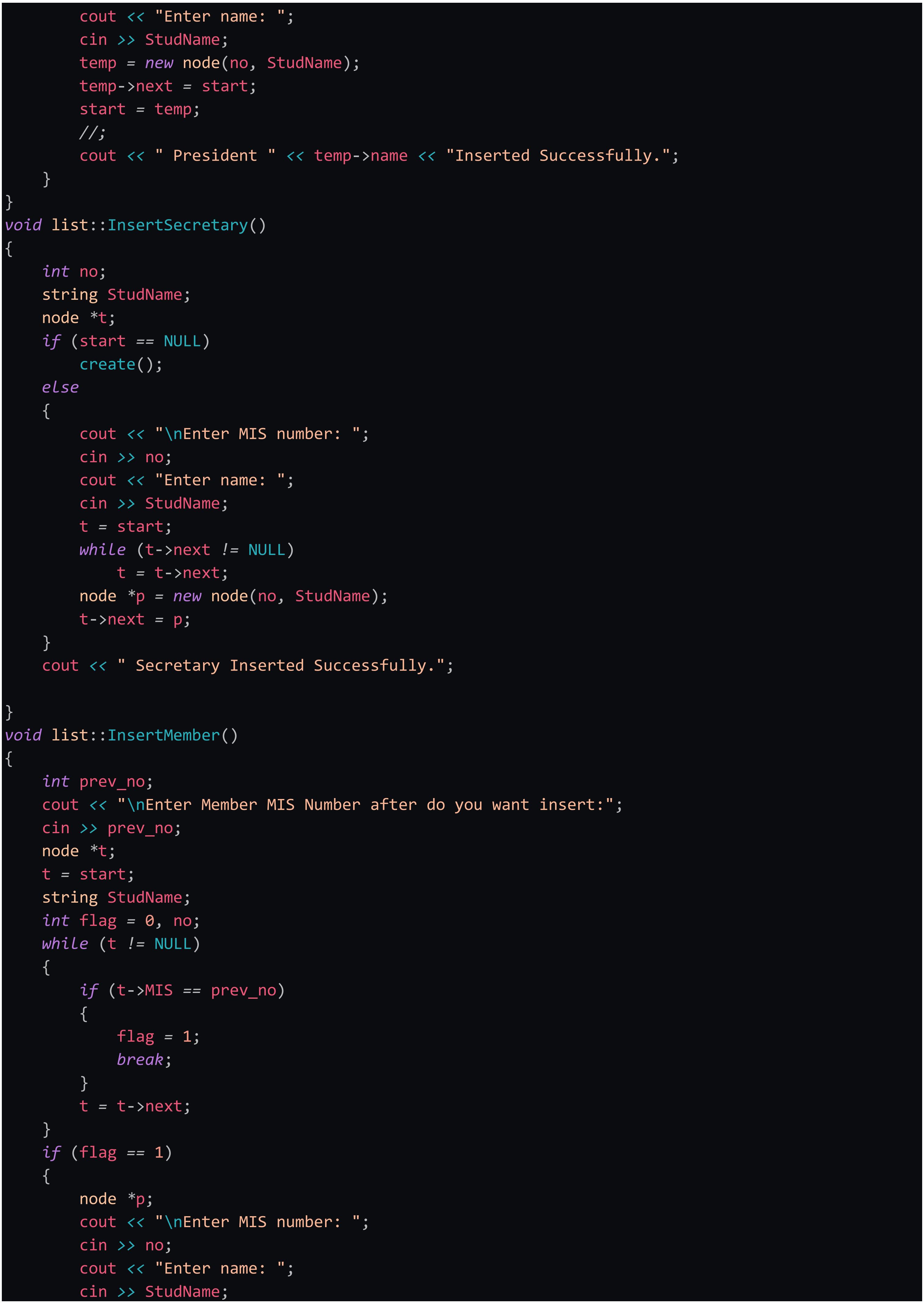
Program:



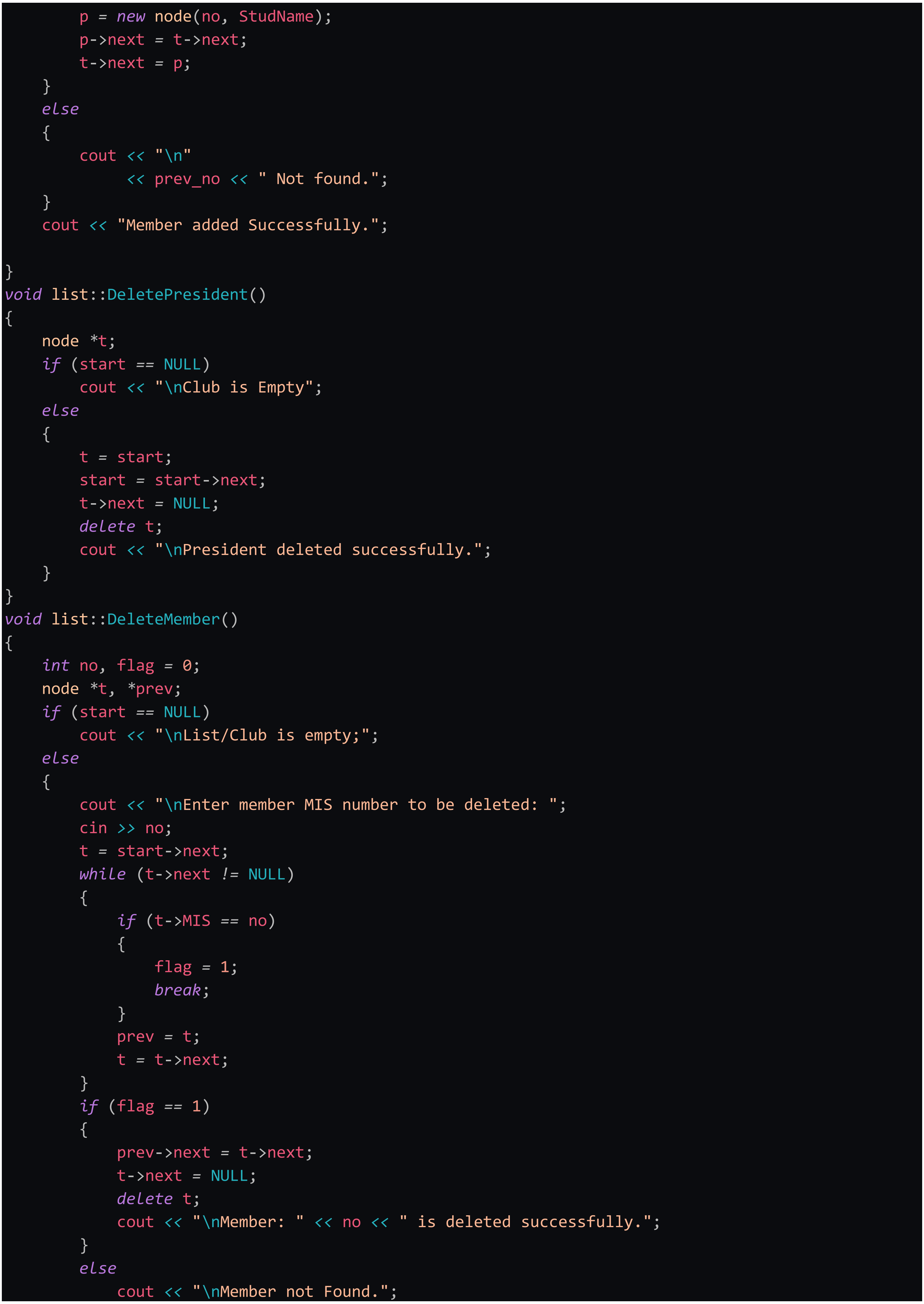
```
#include <iostream>
#include <string>
using namespace std;
class list;
class node
{
    int MIS;
    string name;
    node *next;

public:
    node(int x, string nem)
    {
        MIS = x;
        next = NULL;
        name = nem;
    }
    friend class list;
};
class list
{
    node *start;

public:
    list()
    {
        start = NULL;
    }
    void create();
    void display();
    void InsertPresident();
    void InsertSecretary();
    void InsertMember();
    void DeletePresident();
    void DeleteMember();
    void DeleteSecretary();
    void SortList();
    void concat(list &q1);
    void RevDisplay(node *t);
    int ContTotal();
    bool DisplayReverse()
    {
        if (start == NULL)
            return false;
        node *temp = start;
        RevDisplay(temp);

        return true;
    }
};
void list::RevDisplay(node *t)
{
```



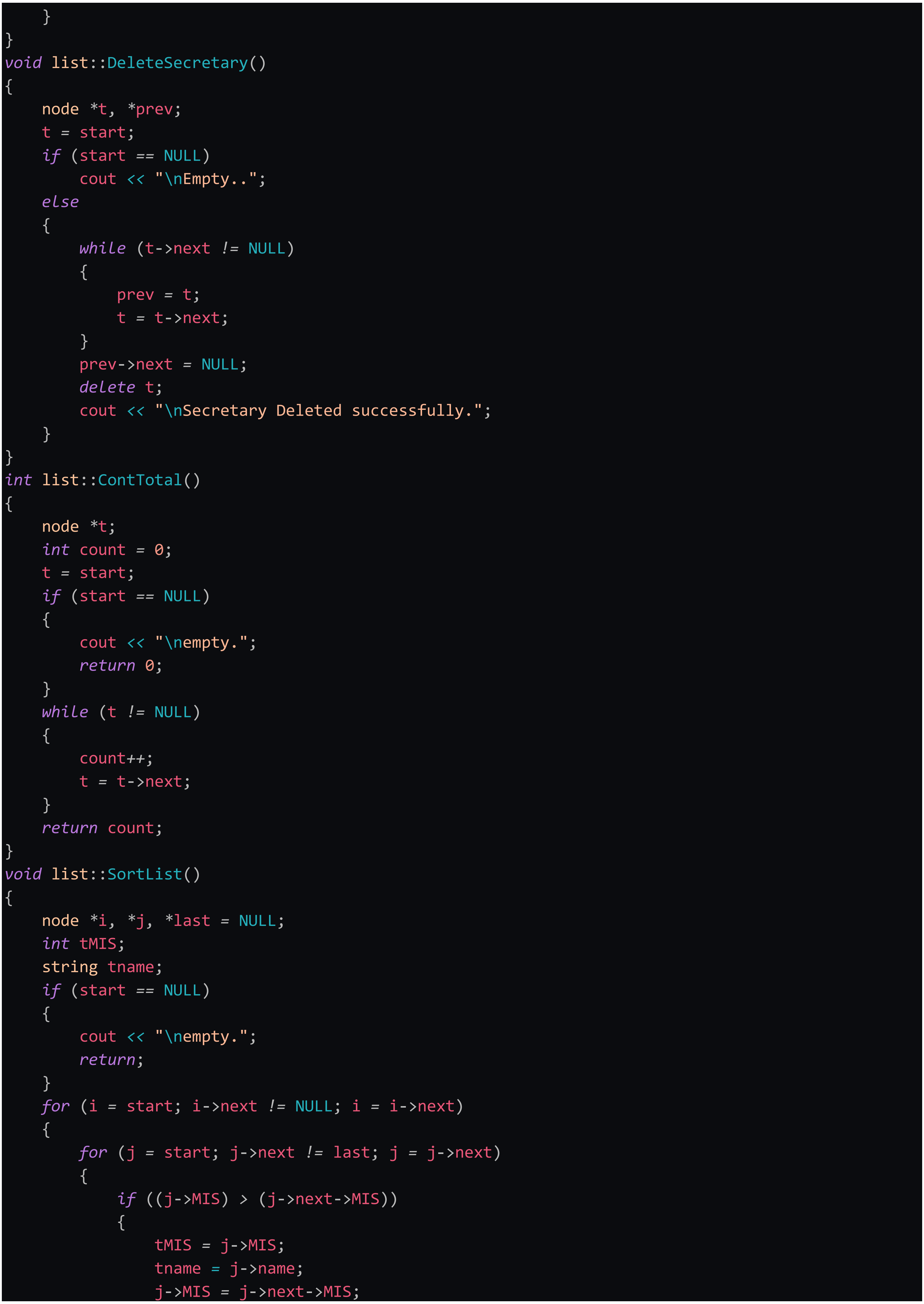
```
    if (t == NULL)
        return;
    else
    {
        RevDisplay(t->next);
        cout << "\nMIS NO:" << t->MIS << " Name: " << t->name;
    }
}
void list::create()
{
    int no;
    string StudName;
    if (start == NULL)
    {
        cout << "Enter MIS number: ";
        cin >> no;
        cout << "Enter name: ";
        cin >> StudName;
        cout << StudName;
        start = new node(no, StudName);
        cout << "\n*Added Successfully*";
    }
    else
    {
        cout << "\nList is Already Created.";
    }
}
void list::display()
{
    node *t;
    t = start;
    if (start == NULL)
        cout << "\nList is Empty";
    else
    {
        cout << "\n***** List: *****\n";
        while (t != NULL)
        {
            cout << t->MIS << " " << t->name << " \n";
            t = t->next;
        }
    }
}
void list::InsertPresident()
{
    int no;
    string StudName;
    node *temp;
    if (start == NULL)
    {
        create();
    }
    else
    {
        cout << "\nEnter MIS number: ";
        cin >> no;
```



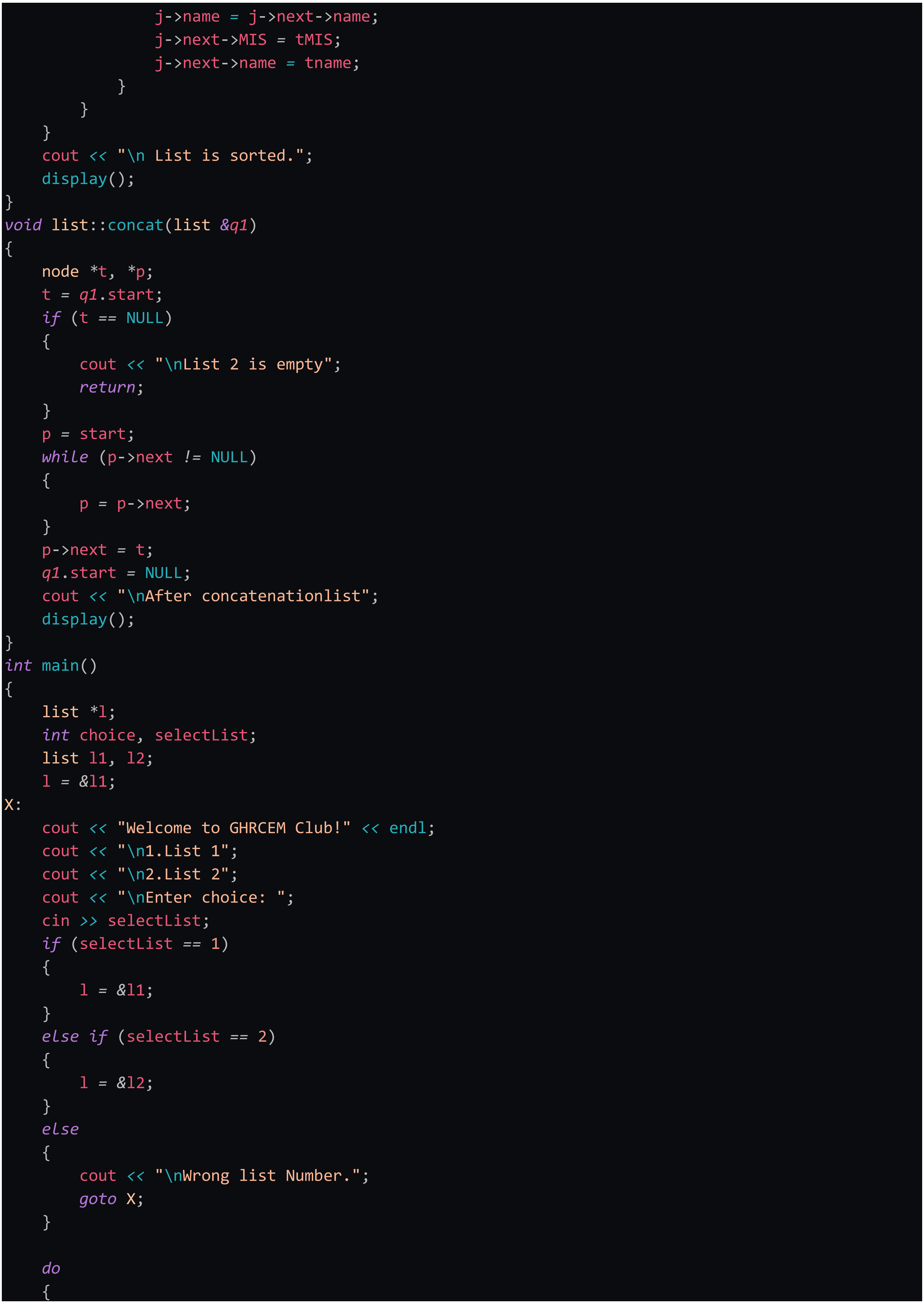
```
        cout << "Enter name: ";
        cin >> StudName;
        temp = new node(no, StudName);
        temp->next = start;
        start = temp;
        //;
        cout << " President " << temp->name << "Inserted Successfully.";
    }
}
void list::InsertSecretary()
{
    int no;
    string StudName;
    node *t;
    if (start == NULL)
        create();
    else
    {
        cout << "\nEnter MIS number: ";
        cin >> no;
        cout << "Enter name: ";
        cin >> StudName;
        t = start;
        while (t->next != NULL)
            t = t->next;
        node *p = new node(no, StudName);
        t->next = p;
    }
    cout << " Secretary Inserted Successfully.";

}
void list::InsertMember()
{
    int prev_no;
    cout << "\nEnter Member MIS Number after do you want insert:";
    cin >> prev_no;
    node *t;
    t = start;
    string StudName;
    int flag = 0, no;
    while (t != NULL)
    {
        if (t->MIS == prev_no)
        {
            flag = 1;
            break;
        }
        t = t->next;
    }
    if (flag == 1)
    {
        node *p;
        cout << "\nEnter MIS number: ";
        cin >> no;
        cout << "Enter name: ";
        cin >> StudName;
```



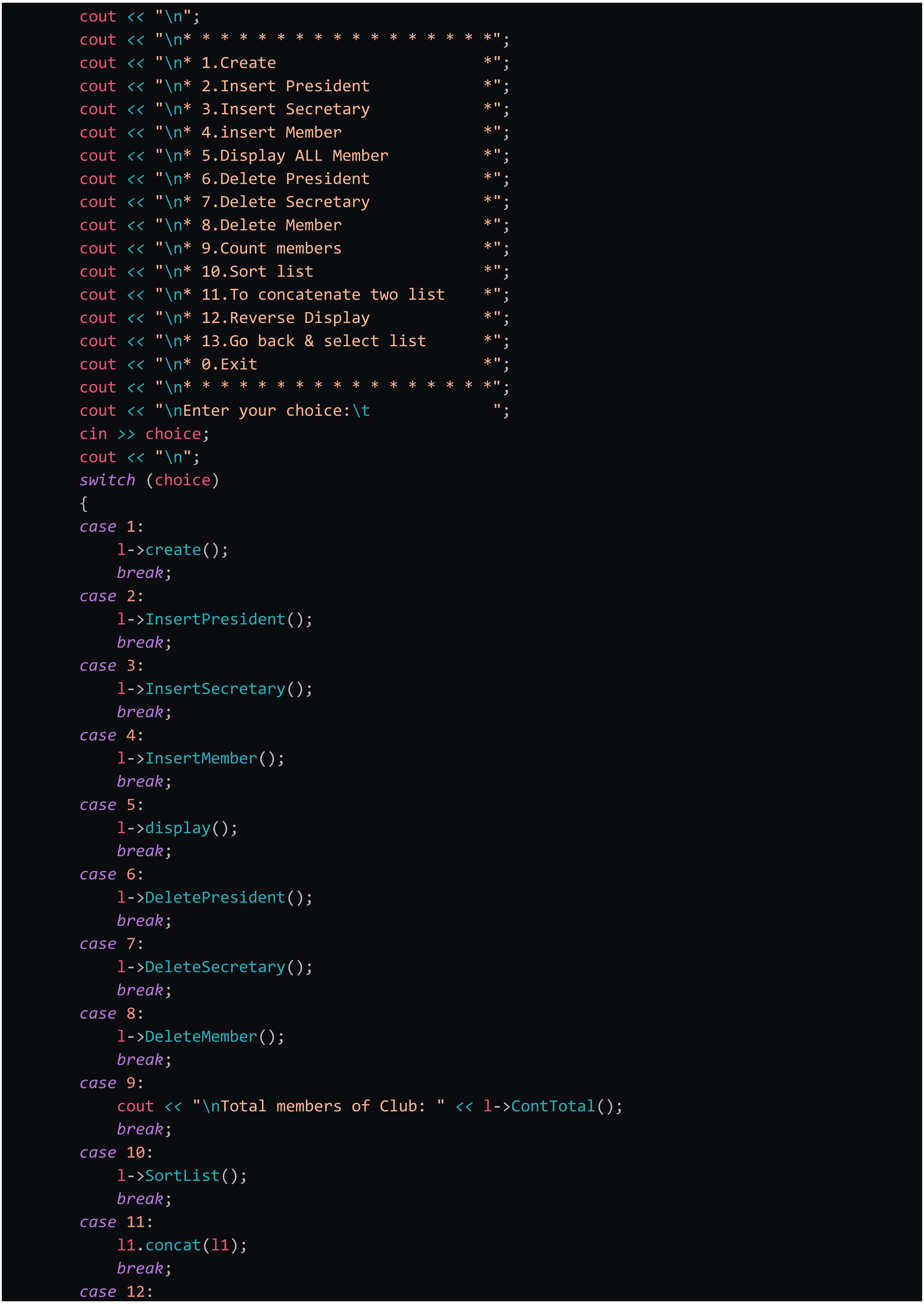
```
        p = new node(no, StudName);
        p->next = t->next;
        t->next = p;
    }
    else
    {
        cout << "\n"
             << prev_no << " Not found.";
    }
    cout << "Member added Successfully.";

}
void list::DeletePresident()
{
    node *t;
    if (start == NULL)
        cout << "\nClub is Empty";
    else
    {
        t = start;
        start = start->next;
        t->next = NULL;
        delete t;
        cout << "\nPresident deleted successfully.";
    }
}
void list::DeleteMember()
{
    int no, flag = 0;
    node *t, *prev;
    if (start == NULL)
        cout << "\nList/Club is empty;";
    else
    {
        cout << "\nEnter member MIS number to be deleted: ";
        cin >> no;
        t = start->next;
        while (t->next != NULL)
        {
            if (t->MIS == no)
            {
                flag = 1;
                break;
            }
            prev = t;
            t = t->next;
        }
        if (flag == 1)
        {
            prev->next = t->next;
            t->next = NULL;
            delete t;
            cout << "\nMember: " << no << " is deleted successfully.";
        }
        else
            cout << "\nMember not Found.";
```



```
    }
}
void list::DeleteSecretary()
{
    node *t, *prev;
    t = start;
    if (start == NULL)
        cout << "\nEmpty..";
    else
    {
        while (t->next != NULL)
        {
            prev = t;
            t = t->next;
        }
        prev->next = NULL;
        delete t;
        cout << "\nSecretary Deleted successfully.";
    }
}
int list::ContTotal()
{
    node *t;
    int count = 0;
    t = start;
    if (start == NULL)
    {
        cout << "\nempty.";
        return 0;
    }
    while (t != NULL)
    {
        count++;
        t = t->next;
    }
    return count;
}
void list::SortList()
{
    node *i, *j, *last = NULL;
    int tMIS;
    string tname;
    if (start == NULL)
    {
        cout << "\nempty.";
        return;
    }
    for (i = start; i->next != NULL; i = i->next)
    {
        for (j = start; j->next != last; j = j->next)
        {
            if ((j->MIS) > (j->next->MIS))
            {
                tMIS = j->MIS;
                tname = j->name;
                j->MIS = j->next->MIS;
```

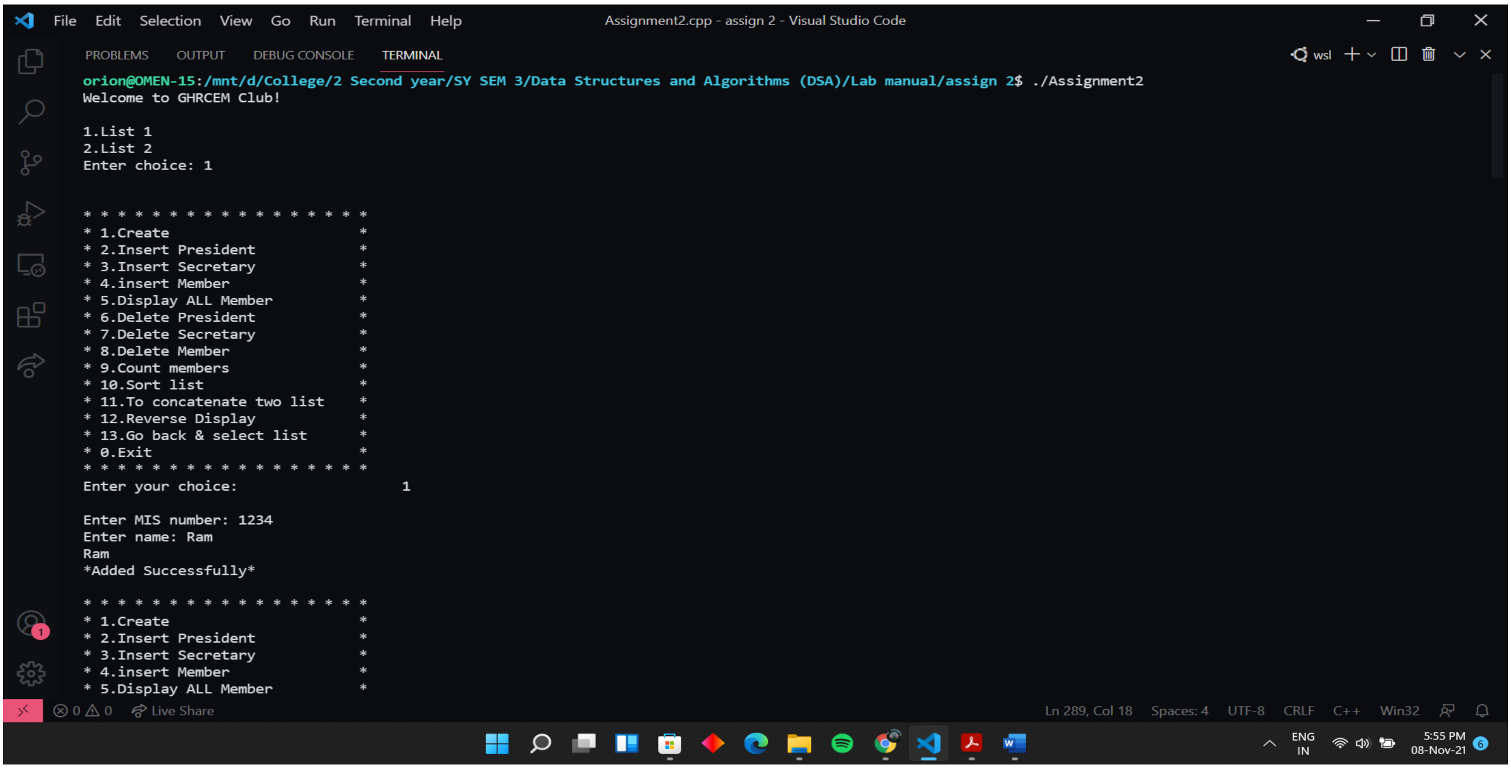


```
                j->name = j->next->name;
                j->next->MIS = tMIS;
                j->next->name = tname;
            }
        }
    }
    cout << "\n List is sorted.";
    display();
}
void list::concat(list &q1)
{
    node *t, *p;
    t = q1.start;
    if (t == NULL)
    {
        cout << "\nList 2 is empty";
        return;
    }
    p = start;
    while (p->next != NULL)
    {
        p = p->next;
    }
    p->next = t;
    q1.start = NULL;
    cout << "\nAfter concatenationlist";
    display();
}
int main()
{
    list *l;
    int choice, selectList;
    list l1, l2;
    l = &l1;
X:
    cout << "Welcome to GHRCEM Club!" << endl;
    cout << "\n1.List 1";
    cout << "\n2.List 2";
    cout << "\nEnter choice: ";
    cin >> selectList;
    if (selectList == 1)
    {
        l = &l1;
    }
    else if (selectList == 2)
    {
        l = &l2;
    }
    else
    {
        cout << "\nWrong list Number.";
        goto X;
    }

    do
    {
```



```
        cout << "\n";
        cout << "\n* * * * * * * * * * * * * * * * *";
        cout << "\n* 1.Create                      *";
        cout << "\n* 2.Insert President            *";
        cout << "\n* 3.Insert Secretary            *";
        cout << "\n* 4.insert Member               *";
        cout << "\n* 5.Display ALL Member          *";
        cout << "\n* 6.Delete President            *";
        cout << "\n* 7.Delete Secretary            *";
        cout << "\n* 8.Delete Member               *";
        cout << "\n* 9.Count members               *";
        cout << "\n* 10.Sort list                  *";
        cout << "\n* 11.To concatenate two list    *";
        cout << "\n* 12.Reverse Display            *";
        cout << "\n* 13.Go back & select list      *";
        cout << "\n* 0.Exit                        *";
        cout << "\n* * * * * * * * * * * * * * * * *";
        cout << "\nEnter your choice:\t             ";
        cin >> choice;
        cout << "\n";
        switch (choice)
        {
        case 1:
            l->create();
            break;
        case 2:
            l->InsertPresident();
            break;
        case 3:
            l->InsertSecretary();
            break;
        case 4:
            l->InsertMember();
            break;
        case 5:
            l->display();
            break;
        case 6:
            l->DeletePresident();
            break;
        case 7:
            l->DeleteSecretary();
            break;
        case 8:
            l->DeleteMember();
            break;
        case 9:
            cout << "\nTotal members of Club: " << l->ContTotal();
            break;
        case 10:
            l->SortList();
            break;
        case 11:
            l1.concat(l1);
            break;
        case 12:
            l->DisplayReverse();
            break;
        case 13:
            goto X;
            break;
        deafult:
            cout << "Wrong input try again";
        }
    } while (choice != 0);
    cout << "\nThank you!!\n";
    return 0;
}
```

Output :



File Edit Selection View Go Run Terminal Help
Assignment2.cpp - assign 2 - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
wsl
Live Share
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ENG IN
5:55 PM 08-Nov-21

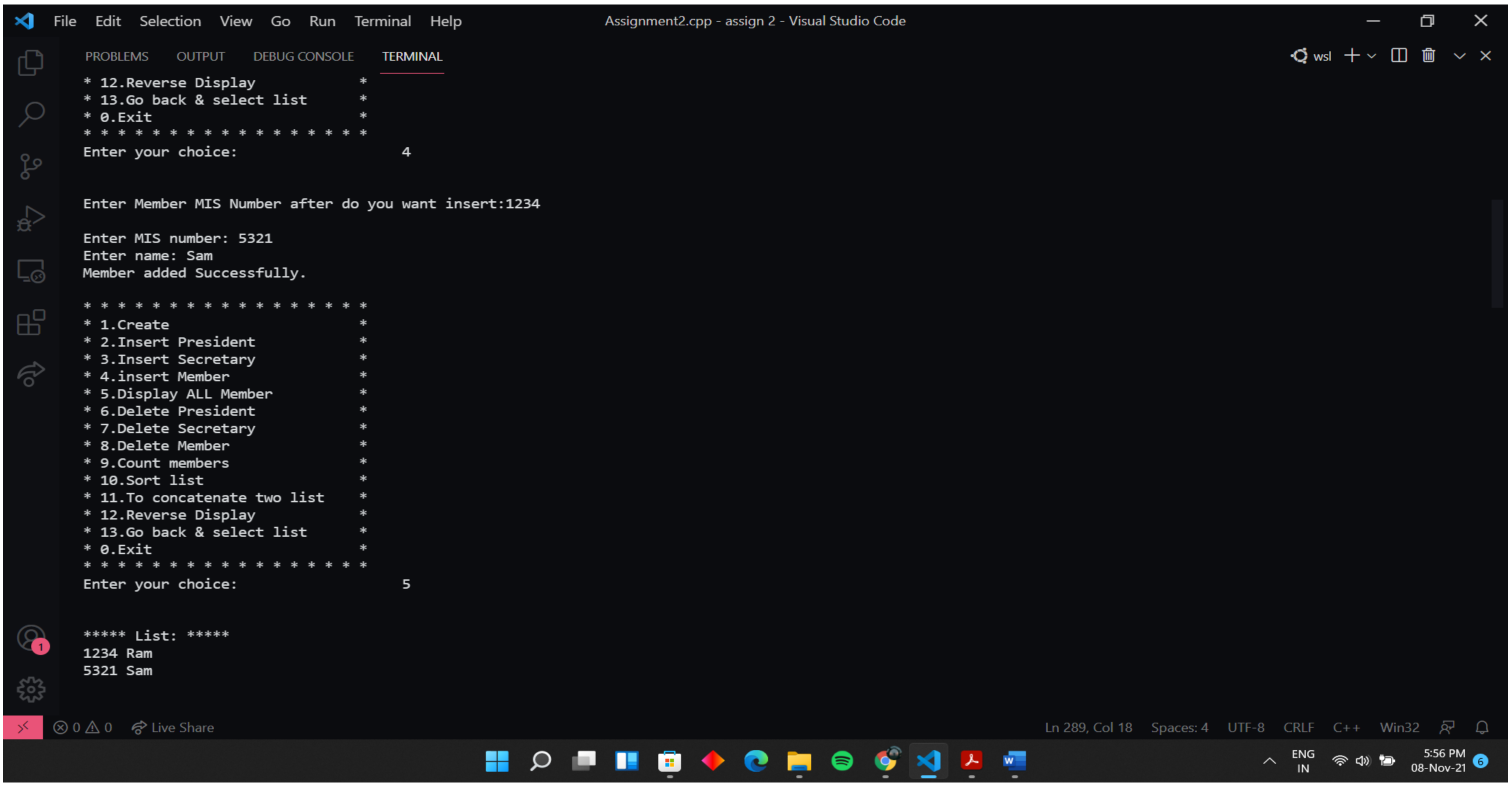
```
orion@OMEN-15:/mnt/d/College/2 Second year/SY SEM 3/Data Structures and Algorithms (DSA)/Lab manual/assign 2$ ./Assignment2
Welcome to GHRCEM Club!

1.List 1
2.List 2
Enter choice: 1


* * * * * * * * * * * * * * * * *
* 1.Create                      *
* 2.Insert President            *
* 3.Insert Secretary            *
* 4.insert Member               *
* 5.Display ALL Member          *
* 6.Delete President            *
* 7.Delete Secretary            *
* 8.Delete Member               *
* 9.Count members               *
* 10.Sort list                  *
* 11.To concatenate two list    *
* 12.Reverse Display            *
* 13.Go back & select list      *
* 0.Exit                        *
* * * * * * * * * * * * * * * * *
Enter your choice:                      1

Enter MIS number: 1234
Enter name: Ram
Ram
*Added Successfully*

* * * * * * * * * * * * * * * * *
* 1.Create                      *
* 2.Insert President            *
* 3.Insert Secretary            *
* 4.insert Member               *
* 5.Display ALL Member          *
```



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Assignment2.cpp - assign 2 - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
wsl
Live Share
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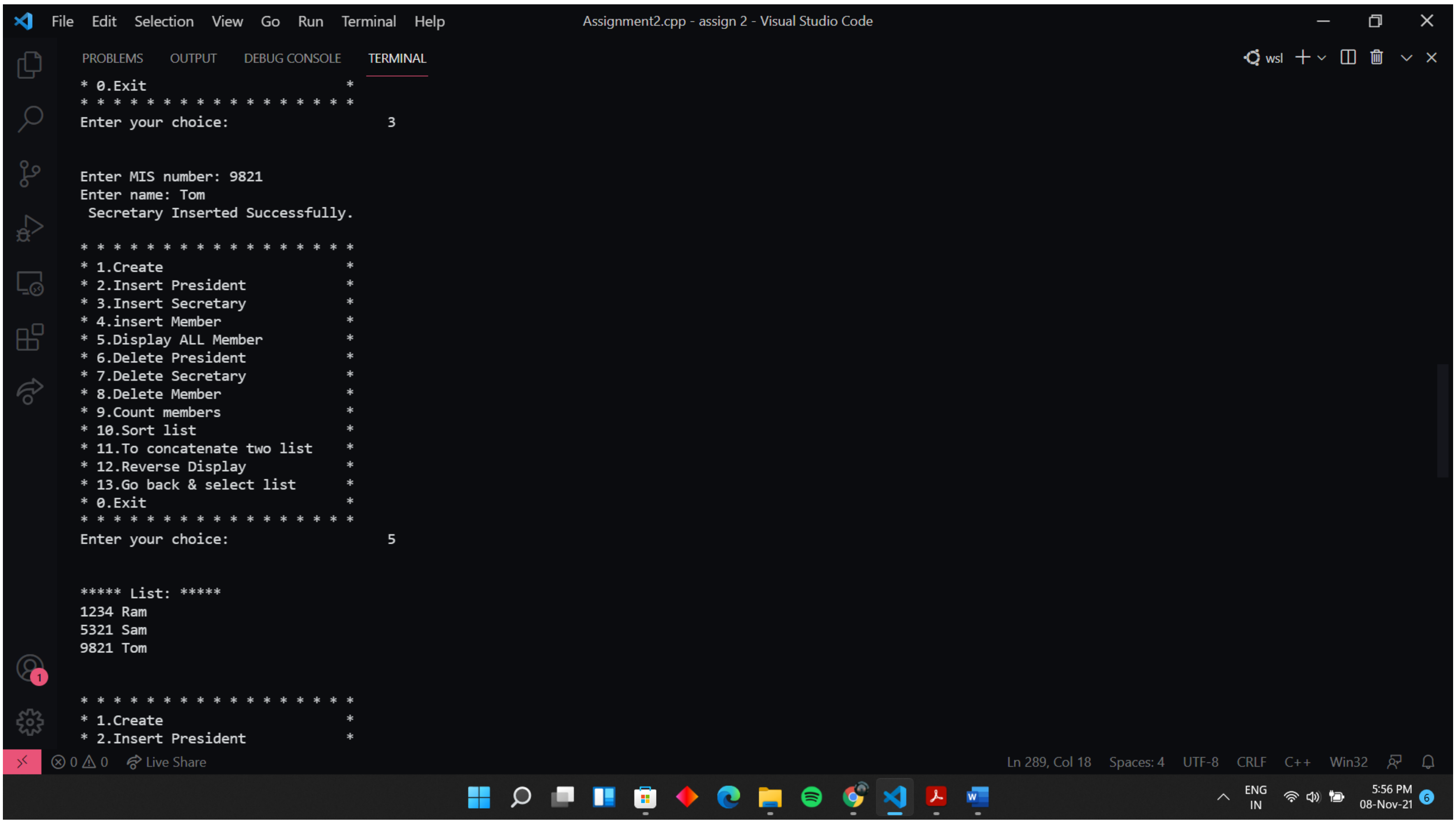
```
* 12.Reverse Display            *
* 13.Go back & select list      *
* 0.Exit                        *
* * * * * * * * * * * * * * * * *
Enter your choice:                      4


Enter Member MIS Number after do you want insert:1234

Enter MIS number: 5321
Enter name: Sam
Member added Successfully.

* * * * * * * * * * * * * * * * *
* 1.Create                      *
* 2.Insert President            *
* 3.Insert Secretary            *
* 4.insert Member               *
* 5.Display ALL Member          *
* 6.Delete President            *
* 7.Delete Secretary            *
* 8.Delete Member               *
* 9.Count members               *
* 10.Sort list                  *
* 11.To concatenate two list    *
* 12.Reverse Display            *
* 13.Go back & select list      *
* 0.Exit                        *
* * * * * * * * * * * * * * * * *
Enter your choice:                      5


***** List: *****
1234 Ram
5321 Sam
```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Assignment2.cpp - assign 2 - Visual Studio Code
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Live Share
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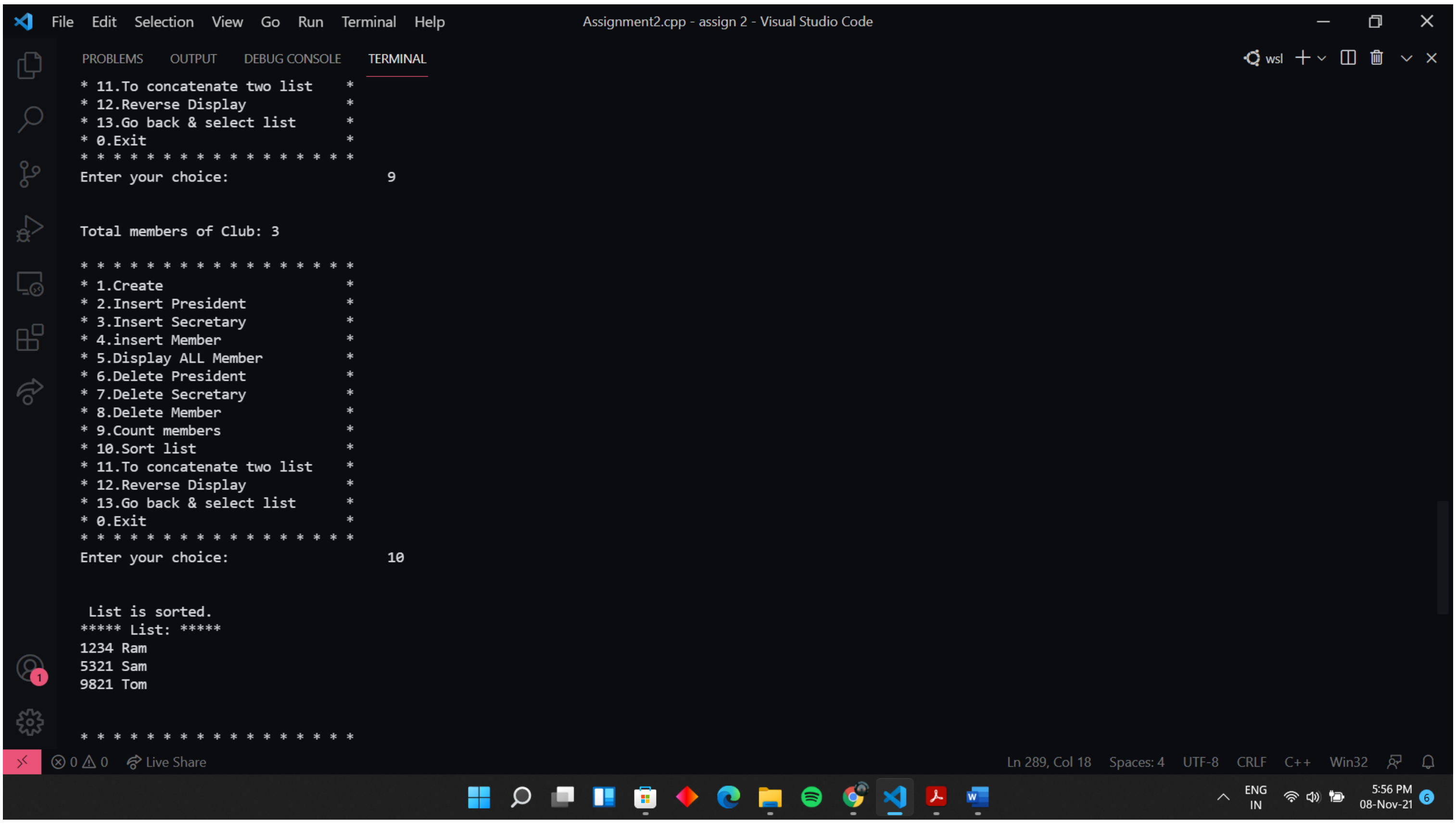
```
* 0.Exit                        *
* * * * * * * * * * * * * * * * *
Enter your choice:                   3


Enter MIS number: 9821
Enter name: Tom
 Secretary Inserted Successfully.

* * * * * * * * * * * * * * * * *
* 1.Create                      *
* 2.Insert President            *
* 3.Insert Secretary            *
* 4.insert Member               *
* 5.Display ALL Member          *
* 6.Delete President            *
* 7.Delete Secretary            *
* 8.Delete Member               *
* 9.Count members               *
* 10.Sort list                  *
* 11.To concatenate two list    *
* 12.Reverse Display            *
* 13.Go back & select list      *
* 0.Exit                        *
* * * * * * * * * * * * * * * * *
Enter your choice:                   5


***** List: *****
1234 Ram
5321 Sam
9821 Tom


* * * * * * * * * * * * * * * * *
* 1.Create                      *
* 2.Insert President            *
```


File Edit Selection View Go Run Terminal Help
Assignment2.cpp - assign 2 - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
wsl
Live Share
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```
* 11.To concatenate two list    *
* 12.Reverse Display            *
* 13.Go back & select list      *
* 0.Exit                        *
* * * * * * * * * * * * * * * * *
Enter your choice:                   9


Total members of Club: 3

* * * * * * * * * * * * * * * * *
* 1.Create                      *
* 2.Insert President            *
* 3.Insert Secretary            *
* 4.insert Member               *
* 5.Display ALL Member          *
* 6.Delete President            *
* 7.Delete Secretary            *
* 8.Delete Member               *
* 9.Count members               *
* 10.Sort list                  *
* 11.To concatenate two list    *
* 12.Reverse Display            *
* 13.Go back & select list      *
* 0.Exit                        *
* * * * * * * * * * * * * * * * *
Enter your choice:                   10


 List is sorted.
***** List: *****
1234 Ram
5321 Sam
9821 Tom


* * * * * * * * * * * * * * * * *
```

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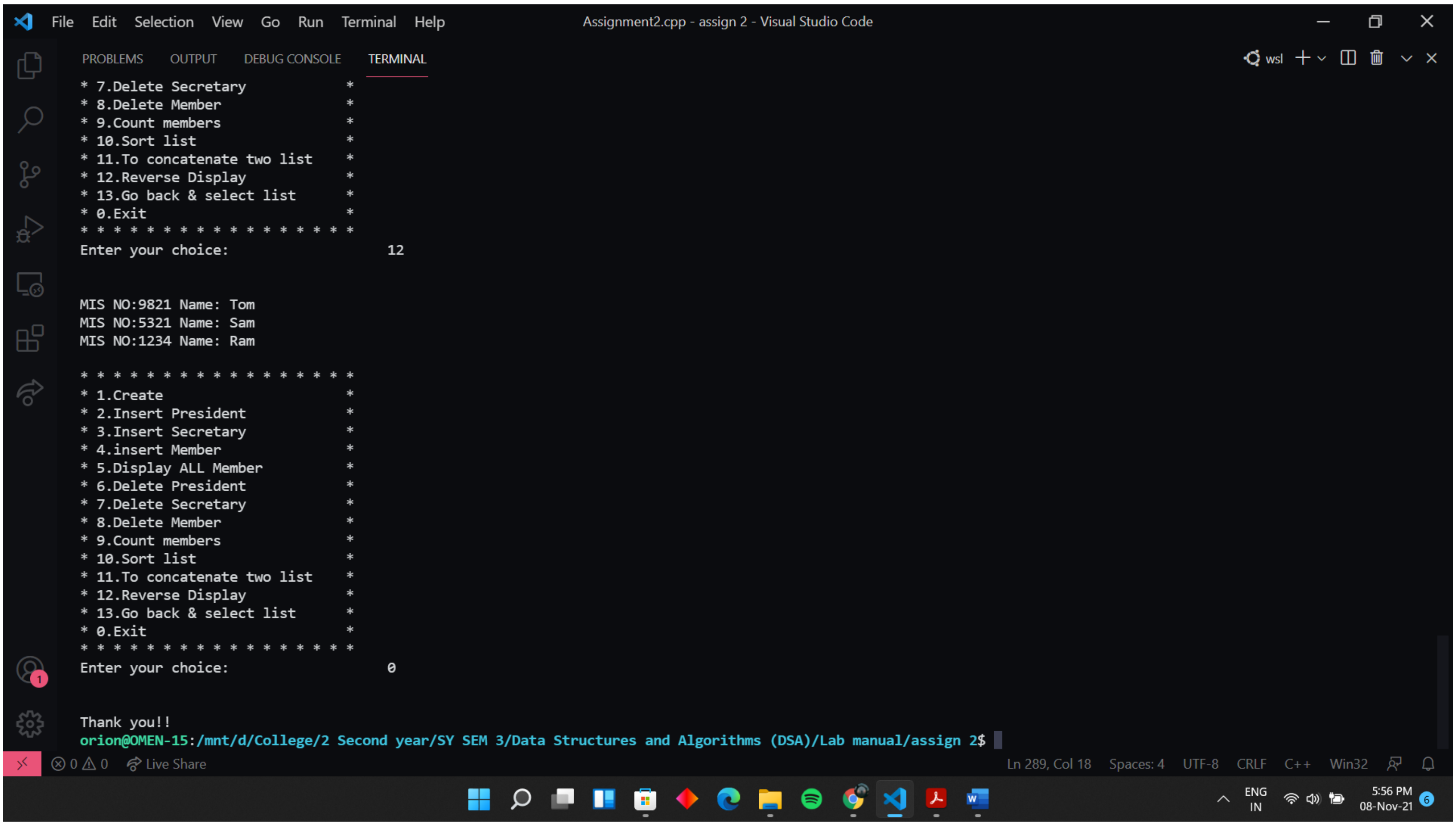
File Edit Selection View Go Run Terminal Help
Assignment2.cpp - assign 2 - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
wsl
Ln 289, Col 18 Spaces: 4 UTF-8 CRLF C++ Win32
Live Share
ENG IN
5:56 PM 08-Nov-21

```
* 7.Delete Secretary         *
* 8.Delete Member            *
* 9.Count members            *
* 10.Sort list               *
* 11.To concatenate two list *
* 12.Reverse Display         *
* 13.Go back & select list   *
* 0.Exit                     *
* * * * * * * * * * * * * * * * *
Enter your choice:                  12


MIS NO:9821 Name: Tom
MIS NO:5321 Name: Sam
MIS NO:1234 Name: Ram

* * * * * * * * * * * * * * * * *
* 1.Create                   *
* 2.Insert President         *
* 3.Insert Secretary         *
* 4.insert Member            *
* 5.Display ALL Member       *
* 6.Delete President         *
* 7.Delete Secretary         *
* 8.Delete Member            *
* 9.Count members            *
* 10.Sort list               *
* 11.To concatenate two list *
* 12.Reverse Display         *
* 13.Go back & select list   *
* 0.Exit                     *
* * * * * * * * * * * * * * * * *
Enter your choice:                  0


Thank you!!
orion@OMEN-15:/mnt/d/College/2 Second year/SY SEM 3/Data Structures and Algorithms (DSA)/Lab manual/assign 2$
```

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