Practical 7

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- 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 member's information using singly linked list. Store student PRN and Name. Write functions to:
- Add and delete the members as well as president or even secretary.
- Compute total number of members of club
- Display members
- Two linked lists exists for two divisions. Concatenate two lists.

```
#include <iostream>

#include <string>


using namespace std;


struct Member {

   string prn;

   string name;

   Member* next;

};


class PinnacleClub {

private:

   Member* head;

   Member* president;

   Member* secretary;


public:

   PinnacleClub() {

      head = nullptr;
```

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```
        president = new Member{"PRESIDENT_PRN", "President
Name", nullptr};
        secretary = new Member{"SECRETARY_PRN", "Secretary
Name", nullptr};
        head = president; // President is the first member
        president->next = secretary; // Secretary is the last member
    }

    ~PinnacleClub() {
        clearList();
        delete president;
        delete secretary;
    }

    void clearList() {
        Member* current = head;
        while (current != nullptr) {
            Member* toDelete = current;
            current = current->next;
            delete toDelete;
        }
        head = nullptr;
    }

    void addMember(const string& prn, const string& name) {
        Member* newMember = new Member{prn, name, nullptr};
        // Insert new member before secretary
        Member* current = head;
        while (current->next != secretary) {
            current = current->next;
        }
        current->next = newMember;
        newMember->next = secretary; // New member points to
secretary
    }

    void deleteMember(const string& prn) {
        Member* current = head;
        Member* previous = nullptr;

        while (current != nullptr && current->prn != prn) {
            previous = current;
            current = current->next;
        }

        if (current == nullptr) {
            cout << "Member not found!" << endl;
            return;
        }

        if (previous != nullptr) {
            previous->next = current->next;
        } else {
            // If the member to delete is the president or if the list only
has them
            head = current->next;
        }
        delete current;
        cout << "Member deleted successfully!" << endl;
    }

    int totalMembers() {
        int count = 0;
        Member* current = head;

        while (current != nullptr) {
            count++;
            current = current->next;
        }
        return count - 2; // Exclude president and secretary
    }

    void displayMembers() {
        Member* current = head;
        cout << "Club Members:" << endl;
        while (current != nullptr) {
            cout << "PRN: " << current->prn << ", Name: " << current-
>name << endl;
            current = current->next;
        }
    }

    void concatenate(PinnacleClub& other) {
        Member* current = head;
        while (current->next != secretary) {
            current = current->next;
        }
        current->next = other.head->next; // Skip president
        other.head->next = nullptr; // Clear the other list
    }
};

int main() {
    PinnacleClub divisionA;

    divisionA.addMember("123", "Alice");
    divisionA.addMember("124", "Bob");

    divisionA.displayMembers();
    cout << "Total members: " << divisionA.totalMembers() << endl;

    divisionA.deleteMember("123");
    divisionA.displayMembers();
    cout << "Total members: " << divisionA.totalMembers() << endl;

    PinnacleClub divisionB;
    divisionB.addMember("125", "Charlie");
    divisionB.addMember("126", "David");

    divisionA.concatenate(divisionB);
    divisionA.displayMembers();
```

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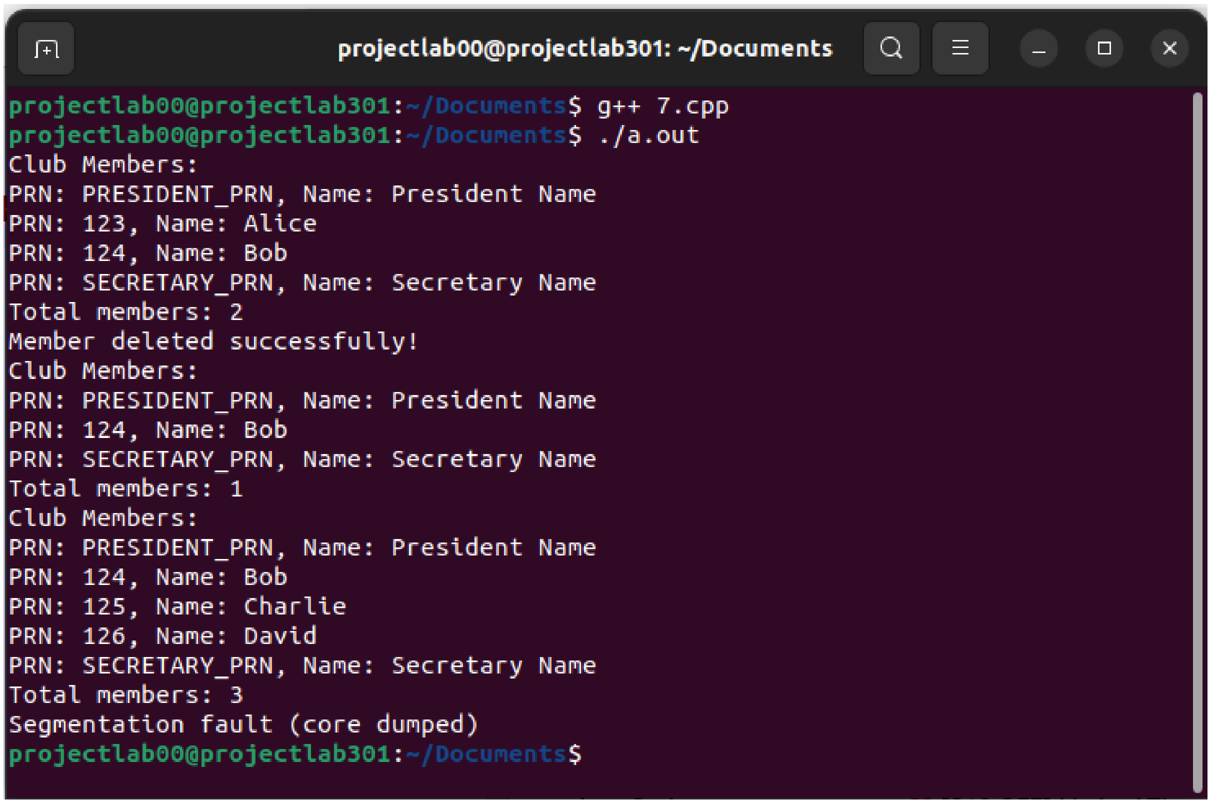
```
    cout << "Total members: " << divisionA.totalMembers() << endl;


    return 0;
}
// OUTPUT
```



```
projectlab00@projectlab301:~/Documents$ g++ 7.cpp
projectlab00@projectlab301:~/Documents$ ./a.out
Club Members:
PRN: PRESIDENT_PRN, Name: President Name
PRN: 123, Name: Alice
PRN: 124, Name: Bob
PRN: SECRETARY_PRN, Name: Secretary Name
Total members: 2
Member deleted successfully!
Club Members:
PRN: PRESIDENT_PRN, Name: President Name
PRN: 124, Name: Bob
PRN: SECRETARY_PRN, Name: Secretary Name
Total members: 1
Club Members:
PRN: PRESIDENT_PRN, Name: President Name
PRN: 124, Name: Bob
PRN: 125, Name: Charlie
PRN: 126, Name: David
PRN: SECRETARY_PRN, Name: Secretary Name
Total members: 3
Segmentation fault (core dumped)
projectlab00@projectlab301:~/Documents$
```