MFG Assignment No:01

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Batch : C

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/* Write a program to implement set operations to manage
membership in school clubs.A school has two clubs: the Drama Club and the Science Club.
Set A={students in the Drama Club}
Set B={students in the Science Club}
Perform following tasks :
● Find Students in at least one club.
● Find Students in both clubs.
● Find students in the Drama Club but not in the Science Club.
● Find Students in the Science Club but not in the Drama Club.
● If a student is not a member of any club*/

#include <iostream>
using namespace std;

int main() {
    int allStudents[100];
    int allCount;
    int dramaClub[50], scienceClub[50];
    int dramaCount, scienceCount;

    cout << "=== SCHOOL CLUB MANAGEMENT ===" << endl;

    // Input all students in school at the beginning
    cout << "\nEnter total number of students in school: ";
    cin >> allCount;
    cout << "Enter roll numbers of all students in school:" << endl;
    for(int i = 0; i < allCount; i++) {
        cout << "Student " << i+1 << ": ";
    cin >> allStudents[i];
}

// Input for Drama Club
cout << "\nEnter number of students in Drama Club: ";
cin >> dramaCount;
cout << "Enter roll numbers of Drama Club students:" << endl;
for(int i = 0; i < dramaCount; i++) {
    cout << "Student " << i+1 << ": ";
    cin >> dramaClub[i];
}

// Input for Science Club
cout << "\nEnter number of students in Science Club: ";
cin >> scienceCount;
cout << "Enter roll numbers of Science Club students:" << endl;
for(int i = 0; i < scienceCount; i++) {
    cout << "Student " << i+1 << ": ";
    cin >> scienceClub[i];
}

// Display club members
cout << "\n=== CLUB MEMBERS ===" << endl;
cout << "Drama Club Members (Roll Numbers): ";
for(int i = 0; i < dramaCount; i++) {
    cout << dramaClub[i] << " ";
}

cout << "\nScience Club Members (Roll Numbers): ";
for(int i = 0; i < scienceCount; i++) {
    cout << scienceClub[i] << " ";
}

// Students in at least one club (UNION)
cout << "\n\n=== RESULTS ===" << endl;
cout << "1. Students in at least one club (Roll Numbers): ";
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// First print all drama club students
for(int i = 0; i < dramaCount; i++) {
    cout << dramaClub[i] << " ";
}

// Then print science club students not in drama club
for(int i = 0; i < scienceCount; i++) {
    bool found = false;
    for(int j = 0; j < dramaCount; j++) {
        if(scienceClub[i] == dramaClub[j]) {
            found = true;
            break;
        }
    }
    if(!found) {
        cout << scienceClub[i] << " ";
    }
}

// Students in both clubs (INTERSECTION)
cout << "\n2. Students in both clubs (Roll Numbers): ";
for(int i = 0; i < dramaCount; i++) {
    for(int j = 0; j < scienceCount; j++) {
        if(dramaClub[i] == scienceClub[j]) {
            cout << dramaClub[i] << " ";
            break;
        }
    }
}

// Students only in Drama Club (A - B)
cout << "\n3. Students only in Drama Club (Roll Numbers): ";
for(int i = 0; i < dramaCount; i++) {
    bool inScienceClub = false;
    for(int j = 0; j < scienceCount; j++) {
        if(dramaClub[i] == scienceClub[j]) {
            inScienceClub = true;
            break;
        }
    }
    if(!inScienceClub) {
        cout << dramaClub[i] << " ";
    }
}

// Students only in Science Club (B - A)
cout << "\n4. Students only in Science Club (Roll Numbers): ";
for(int i = 0; i < scienceCount; i++) {
    bool inDramaClub = false;
    for(int j = 0; j < dramaCount; j++) {
        if(scienceClub[i] == dramaClub[j]) {
            inDramaClub = true;
            break;
        }
    }
    if(!inDramaClub) {
        cout << scienceClub[i] << " ";
    }
}

// Students not in any club
cout << "\n5. Students not in any club (Roll Numbers): ";
for(int i = 0; i < allCount; i++) {
    bool inDrama = false;
    bool inScience = false;

    // Check if student is in Drama Club
    for(int j = 0; j < dramaCount; j++) {
        if(allStudents[i] == dramaClub[j]) {
            inDrama = true;
            break;
        }
    }
```

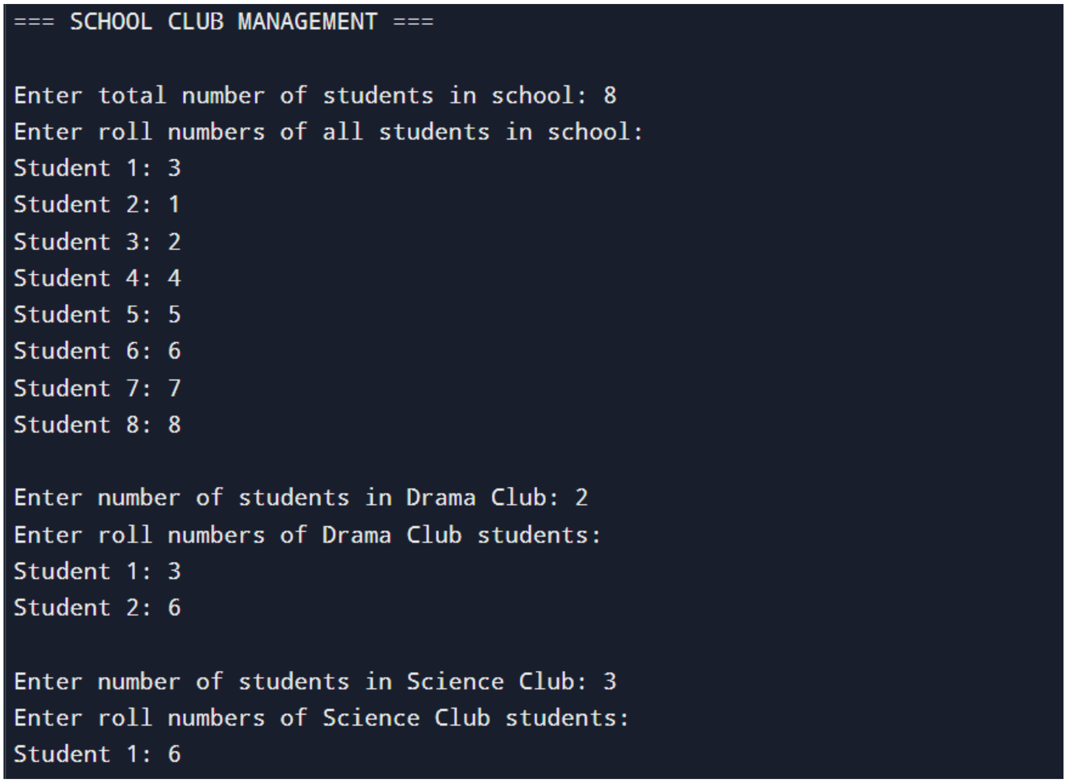
```
        // Check if student is in Science Club
        for(int j = 0; j < scienceCount; j++) {
            if(allStudents[i] == scienceClub[j]) {
                inScience = true;
                break;
            }
        }

        // If not in any club, print the student
        if(!inDrama && !inScience) {
            cout << allStudents[i] << " ";
        }
    }

    // Pause before exiting
    cout << "\n\nProgram completed. Press Enter to exit...";
    cin.ignore();
    cin.get();

    return 0;
}
```

Output:

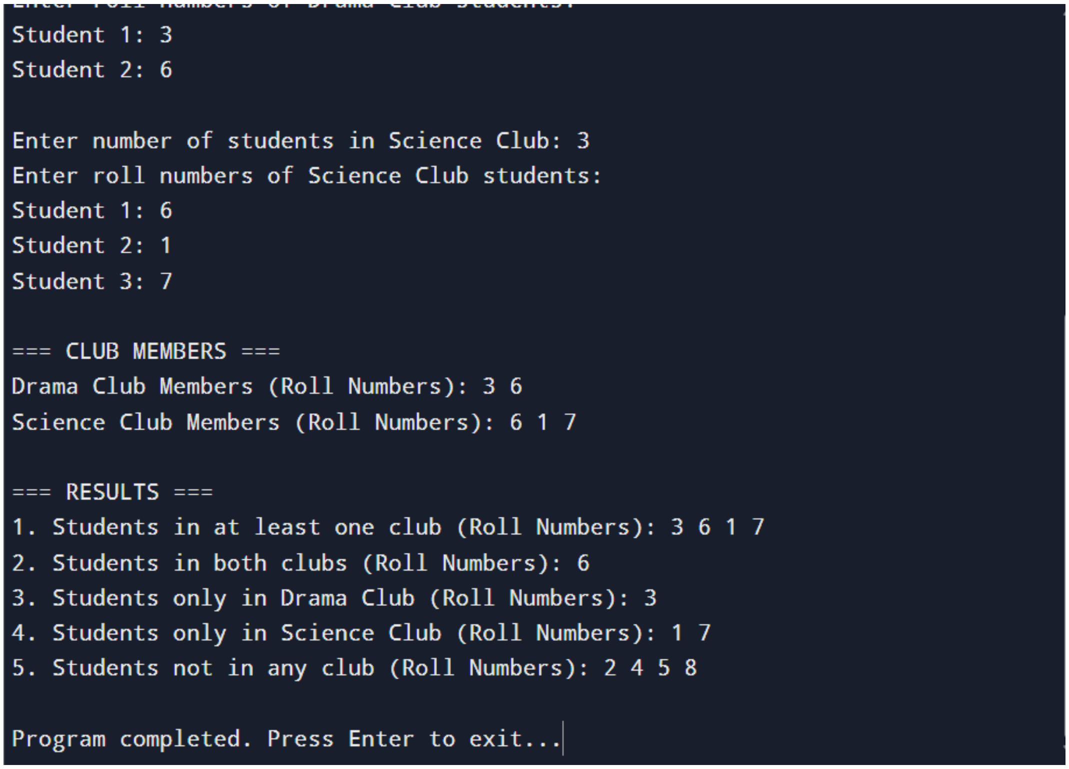


```
=== SCHOOL CLUB MANAGEMENT ===

Enter total number of students in school: 8
Enter roll numbers of all students in school:
Student 1: 3
Student 2: 1
Student 3: 2
Student 4: 4
Student 5: 5
Student 6: 6
Student 7: 7
Student 8: 8

Enter number of students in Drama Club: 2
Enter roll numbers of Drama Club students:
Student 1: 3
Student 2: 6

Enter number of students in Science Club: 3
Enter roll numbers of Science Club students:
Student 1: 6
```



```
Enter roll numbers of Drama Club students:
Student 1: 3
Student 2: 6

Enter number of students in Science Club: 3
Enter roll numbers of Science Club students:
Student 1: 6
Student 2: 1
Student 3: 7

=== CLUB MEMBERS ===
Drama Club Members (Roll Numbers): 3 6
Science Club Members (Roll Numbers): 6 1 7

=== RESULTS ===
1. Students in at least one club (Roll Numbers): 3 6 1 7
2. Students in both clubs (Roll Numbers): 6
3. Students only in Drama Club (Roll Numbers): 3
4. Students only in Science Club (Roll Numbers): 1 7
5. Students not in any club (Roll Numbers): 2 4 5 8

Program completed. Press Enter to exit...
```