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**PRN - B24CE1079**

**SUB - Mathematical Foundation for GenAI**

**ASSIGNMENT 1 - SET OPERATIONS**

**CODE**

/\*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()
{
    string all_students[] = {"Srushti\t", "Anvi\t", "Anil\t", "Sai\t", "Suyash\t", "Aary\t",
        "Vedant\t", "Shruti\t", "Gaurav\t", "Ishwari\t", "Parth\t"};
    int total=11;
    string drama[] = {"Srushti\t", "Anvi\t", "Sai\t", "Aary\t", "Shruti\t", "Gaurav\t"};
    int n1=6;
    string science[] = {"Anvi\t", "Sai\t", "Anil\t", "Suyash\t", "Vedant\t", "Ishwari\t"};
    int n2=6;

    //all students
    cout << "All Students(Universal Set):\n";
    for (int i = 0; i < 11; i++) {
        cout << all_students[i] << " ";
    }
    cout << "\n\n\n";
```

```
//students in drama club
cout << "Drama Club Students:\n";
for (int i = 0; i < n1; i++) {
    cout << drama[i] << " ";
}
cout << "\n\n\n";
```

```
//students in science club
cout << "Science Club Students:\n";
for (int i = 0; i < n2; i++) {
    cout << science[i] << " ";
}
cout << "\n\n\n";
```

```
// students in at least one club
cout << "Students in at least one club:\n";
for (int i = 0; i < n1; i++) {
    cout << drama[i] << " "; // Print all drama students first
}

for (int i = 0; i < n2; i++) {
    int j;
    for (j = 0; j < n1; j++) {
        if (science[i] == drama[j])
            break; // Already printed from drama
    }
    if (j == n1)
        cout << science[i] << " "; // Print only if not in drama
}
cout << "\n\n\n";
```

```
//students in both clubs
cout<<"Students in both clubs:\n";
for (int i=0; i<n1; i++)
{
```

```

    for (int j=0; j<n2; j++)
    {
        if (drama[i] == science[j])
            cout << drama[i] << " ";
    }
}
cout<<"\n\n\n";

```

```

//students in drama club but not in science club
cout << "Students in Drama Club but not in Science Club:\n";
for (int i = 0; i < n1; i++) {
    int j;
    for (j = 0; j < n2; j++) {
        if (drama[i] == science[j])
            break;
    }
    if (j == n2)
        // Not found in science
        cout << drama[i] << " ";
}
cout << "\n\n\n";

```

```

//students in science club but not in drama club
cout<<"Students in science club but not in drama club:\n";
for (int i = 0; i < n2; i++) {
    int j;
    for (j = 0; j < n1; j++) {
        if (science[i] == drama[j])
            break;
    }
    if (j == n1)
        // Not found in drama
        cout << science[i] << " ";
}
cout << "\n\n\n";

```

```

//student not in both clubs
cout<<"Students not in both clubs:\n";

```

```
for (int i = 0; i < total; i++) {  
    int j;  
    // Check in drama  
    for (j = 0; j < n1; j++) {  
        if (all_students[i] == drama[j])  
            break;  
    }  
    if (j < n1) continue;  
  
    // Check in science  
    for (j = 0; j < n2; j++) {  
        if (all_students[i] == science[j])  
            break;  
    }  
    if (j == n2)  
        cout << all_students[i] << " ";  
}  
  
cout << "\n\n\n";  
return 0;  
}
```

## OUTPUT

```
All Students(Universal set):
Srushti Anvi Anil Sai Suyash Aary Vedant Shruti Gaurav Ishwari Parth

Drama Club Students:
Srushti Anvi Sai Aary Shruti Gaurav

Science Club Students:
Anvi Sai Anil Suyash Vedant Ishwari

Students in at least one club:
Srushti Anvi Sai Aary Shruti Gaurav Anil Suyash Vedant Ishwari

Students in both clubs:
Anvi Sai

Students in Drama Club but not in Science Club:
Srushti Aary Shruti Gaurav

Students in science club but not in drama club:
Anil Suyash Vedant Ishwari

Students not in both clubs:
Parth
```