```cpp
/*PRATICAL:01:-In Second year Computer Engineering class of M students, set A of students
play cricket and set B of students play badminton. Write C/C++ program to find and display-
i. Set of students who play either cricket or badminton or both
ii. Set of students who play both cricket and badminton
iii. Set of students who play only cricket
iv. Set of students who play only badminton
v. Number of students who play neither cricket nor badminton*/
#include<iostream>

using namespace std;

int main()
{
    int m[20],M;            //Main
    int a[10],A;            //Cricket
    int b[10],B;            //Badminton
    int c[10],k=0;          //A Union B
    int d[10],l=0;          //A Intersection B
    int e[10],x=0;          //A-(A Intersection B)
    int f[10],y=0;          //B-(A Intersection B)
    int g[10],z=0;          //M-(A Union B)
    int i,j,temp=0;

    //MAIN
    cout<<"\nEnter number of Second Year students=";
    cin>>M;

    cout<<"Enter Roll No of "<<M<<" students:-"<<endl;
    for(i=0;i<M;i++)
    {
        cin>>m[i];
    }

    cout<<"Second Year Students:-\n";
    cout<<"M= {";
    for(i=0;i<M;i++)
    {
        cout<<" "<<m[i];

        if(i<M-1)
        {
            cout<<",";
        }
    }
    cout<<" }"<<endl;
    //MAIN CLOSED
```

```cpp
//CRICKET
cout<<"\n\nEnter number of Students who play Cricket=";
cin>>A;

cout<<"Enter Roll No of "<<A<<" students who play Cricket:-"<<endl;
for(i=0;i<A;i++)
{
    cin>>a[i];
}

cout<<"Students who play Cricket:-\n";
cout<<"A= {";
for(i=0;i<A;i++)
{
    cout<<" "<<a[i];

    if(i<A-1)
    {
        cout<<",";
    }
}
cout<<" }"<<endl;
//CRICKET CLOSED

//BADMINTON
cout<<"\n\nEnter number of Students who play Badminton=";
cin>>B;

cout<<"Enter Roll No of "<<B<<" students who play Badminton:-"<<endl;
for(i=0;i<B;i++)
{
    cin>>b[i];
}

cout<<"Students who play Badminton:-\n";
cout<<"B= {";
for(i=0;i<B;i++)
{
    cout<<" "<<b[i];

    if(i<B-1)
    {
        cout<<",";
    }
}
cout<<" }"<<endl;
//BADMINTON CLOSED
```

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//A UNION B
for(i=0;i<A;i++)
{
    c[k]=a[i];
    k++;
}

for(i=0;i<B;i++)
{
    temp=0;
    for(j=0;j<A;j++)
    {
        if(b[i]==c[j])
        {
            temp=1;
            break;
        }
    }

    if(temp==0)
    {
        c[k]=b[i];
        k++;
    }
}

cout<<"\nStudents who play either Cricket or Badminton or both:-\n";
cout<<"A UNION B= {";
for(i=0;i<k;i++)
{
    cout<<" "<<c[i];

    if(i<k-1)
    {
        cout<<",";
    }
}
cout<<" }\n"<<endl;
//A UNION B CLOSED

//A INTERSECTION B
for(i=0;i<A;i++)
{
    for(j=0;j<B;j++)
    {
        if(a[i]==b[j])
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                {
                    d[l]=a[i];
                    l++;
                }
            }
        }

        cout<<"\nStudents who play both Cricket and Badminton:-\n";
        cout<<"A INTERSECTION B= {";
        for(i=0;i<l;i++)
        {
            cout<<" "<<d[i];

            if(i<l-1)
            {
                cout<<",";
            }
        }
        cout<<" }\n"<<endl;
        //A INTERSECTION B CLOSED

        //A-(A INTERSECTION B)
        for(i=0;i<A;i++)
        {
            temp=1;
            for(j=0;j<l;j++)
            {
                if(a[i]==d[j])
                {
                    temp=0;
                    break;
                }
            }

            if(temp==1)
            {
                e[x]=a[i];
                x++;
            }
        }

        cout<<"\nStudents who play only Cricket:-\n";
        cout<<"A-(A INTERSECTION B)= {";
        for(i=0;i<x;i++)
        {
            cout<<" "<<e[i];
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        if(i<x-1)
        {
            cout<<",";
        }
    }
}
cout<<" }\n"<<endl;
//A-(A INTERSECTION B) CLOSED

//B-(A INTERSECTION B)
for(i=0;i<B;i++)
{
    temp=0;
    for(j=0;j<l;j++)
    {
        if(b[i]==d[j])
        {
            temp=1;
            break;
        }
    }

    if(temp==0)
    {
        f[y]=b[i];
        y++;
    }
}

cout<<"\nStudents who play only Badminton:-\n";
cout<<"B-(A INTERSECTION B)= {";
for(i=0;i<y;i++)
{
    cout<<" "<<f[i];

    if(i<y-1)
    {
        cout<<",";
    }
}
cout<<" }\n"<<endl;
//B-(A INTERSECTION B) CLOSED

//M-(A UNION B)
for(i=0;i<M;i++)
{
    temp=0;
    for(j=0;j<k;j++)
```

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                {
                    if(m[i]==c[j])
                    {
                        temp=1;
                        break;
                    }
                }

                if(temp==0)
                {
                    g[z]=m[i];
                    z++;
                }
        }

        cout<<"\nStudents who play neither Cricket nor Badminton:-\n";
        cout<<"M-(A UNION B)= {";
        for(i=0;i<z;i++)
        {
            cout<<" "<<g[i];

            if(i<z-1)
            {
                cout<<",";
            }
        }
        cout<<" }\n"<<endl;
        //M-(A UNION B) CLOSED

        return 0;
}

/*
-------------output-----------------------
student@ubuntu:~$ g++ set.cpp -o a
student@ubuntu:~$ ./a

Enter number of Second Year students=8
Enter Roll No of 8 students:-
1
2
3
4
5
6
7
8
```

Second Year Students:-
M= { 1, 2, 3, 4, 5, 6, 7, 8 }

Enter number of Students who play Cricket=5
Enter Roll No of 5 students who play Cricket:-
1
3
5
2
6
Students who play Cricket:-
A= { 1, 3, 5, 2, 6 }

Enter number of Students who play Badminton=5
Enter Roll No of 5 students who play Badminton:-
2
4
6
1
3
Students who play Badminton:-
B= { 2, 4, 6, 1, 3 }

Students who play either Cricket or Badminton or both:-
A UNION B= { 1, 3, 5, 2, 6, 4 }

Students who play both Cricket and Badminton:-
A INTERSECTION B= { 1, 3, 2, 6 }

Students who play only Cricket:-
A-(A INTERSECTION B)= { 5 }

Students who play only Badminton:-
B-(A INTERSECTION B)= { 4 }

Students who play neither Cricket nor Badminton:-
M-(A UNION B)= { 7, 8 }

*/