**Practical No:1**

**Problem Statement:** In second year computer engineering class, group A student’s play cricket, group B students play badminton and group C students play football. Write a Python program using functions to compute following: - a) List of students who play both cricket and badminton

b) List of students who play either cricket or badminton but not both

c) Number of students who play neither cricket nor badminton

d) Number of students who play cricket and football but not badminton.

**Program:-**

def accept\_set(A, Str):

    n = int(input("Enter no. of student who play %s : " % Str))

    for i in range(n):

        x = input("Enter the name of student %d who play %s : " % ((i + 1), Str))

        A.append(x)

    print("Set accepted successfully");

def display\_set(A, Str):

    n = len(A)

    if (n == 0):

        print("\nGroup of Students who play %s =  { }" % Str)

    else:

        print("\nGroup of Students who play %s =  {" % Str, end=' ')

        for i in range(n - 1):

            print("%s," % A[i], end=' ')

        print("%s }" % A[n - 1]);

def search\_set(A, X):

    n = len(A)

    for i in range(n):

        if (A[i] == X):

            return (1)

    return (0)

def find\_intersection\_set(A, B, C):

    for i in range(len(A)):

        flag = search\_set(B, A[i]);

        if (flag == 1):

            C.append(A[i])

def find\_difference\_set(A, B, C):

    for i in range(len(A)):

        flag = search\_set(B, A[i]);

        if (flag == 0):

            C.append(A[i])

def find\_union\_set(A, B, C):

    for i in range(len(A)):

        C.append(A[i])

    for i in range(len(B)):

        flag = search\_set(A, B[i]);

        if (flag == 0):

            C.append(B[i])

def Main():

    Group\_A = []

    Group\_B = []

    Group\_C = []

    while True:

        print("\t1 : Accept the Information")

        print("\t2 : List of students play both cricket and badminton")

        print("\t3 : List of students play either cricket or badminton but not both")

        print("\t4 : Number of students play neither cricket nor badminton")

        print("\t5 : Number of students play cricket and football but not badminton")

        print("\t6 : Exit")

        ch = int(input("Enter your choice : "))

        Group\_R = []

        if (ch == 6):

            print("End of Program")

            break

        elif (ch == 1):

            accept\_set(Group\_A, "Cricket")

            accept\_set(Group\_B, "Badminton")

            accept\_set(Group\_C, "Football")

            display\_set(Group\_A, "Cricket")

            display\_set(Group\_B, "Badminton")

            display\_set(Group\_C, "Football")

        elif (ch == 2):

            display\_set(Group\_A, "Cricket")

            display\_set(Group\_B, "Badminton")

            find\_intersection\_set(Group\_A, Group\_B, Group\_R)

            display\_set(Group\_R, " both Cricket and Badminton")

        elif (ch == 3):

            display\_set(Group\_A, "Cricket")

            display\_set(Group\_B, "Badminton")

            R1 = []

            find\_union\_set(Group\_A, Group\_B, R1)

            R2 = []

            find\_intersection\_set(Group\_A, Group\_B, R2)

            find\_difference\_set(R1, R2, Group\_R)

            display\_set(Group\_R, " either cricket or badminton but not both")

        elif (ch == 4):

            display\_set(Group\_A, "Cricket")

            display\_set(Group\_B, "Badminton")

            display\_set(Group\_C, "Football")

            R1 = []

            find\_union\_set(Group\_A, Group\_B, R1)

            find\_difference\_set(Group\_C, R1, Group\_R)

            display\_set(Group\_R, " neither cricket nor badminton")

            print("Number of students who play neither cricket nor badminton = %s" % len(Group\_R))

        elif (ch == 5):

            display\_set(Group\_A, "Cricket")

            display\_set(Group\_C, "Football")

            display\_set(Group\_B, "Badminton")

            R1 = []

            find\_intersection\_set(Group\_A, Group\_C, R1)

            find\_difference\_set(R1, Group\_B, Group\_R)

            display\_set(Group\_R, "cricket and football but not badminton")

            print("Number of students who play cricket and football but not badminton = %s" % len(Group\_R))

        else:

            print("Wrong choice entered !! Try again")

Main()

quit()

**output:**

1 : Accept the Information

2 : List of students play both cricket and badminton

3 : List of students play either cricket or badminton but not both

4 : Number of students play neither cricket nor badminton

5 : Number of students play cricket and football but not badminton

6 : Exit

Enter your choice : 1

Enter no. of student who play Cricket : 4

Enter the name of student 1 who play Cricket : aaa

Enter the name of student 2 who play Cricket : bbb

Enter the name of student 3 who play Cricket : ccc

Enter the name of student 4 who play Cricket : ddd

Set accepted successfully

Enter no. of student who play Badminton : 2

Enter the name of student 1 who play Badminton : eee

Enter the name of student 2 who play Badminton : bbb

Set accepted successfully

Enter no. of student who play Football : 6

Enter the name of student 1 who play Football : www

Enter the name of student 2 who play Football : eee

Enter the name of student 3 who play Football : ttt

Enter the name of student 4 who play Football : aaa

Enter the name of student 5 who play Football : ccc

Enter the name of student 6 who play Football : rrr

Set accepted successfully

Group of Students who play Cricket = { aaa, bbb, ccc, ddd }

Group of Students who play Badminton = { eee, bbb }

Group of Students who play Football = { www, eee, ttt, aaa, ccc, rrr }

1 : Accept the Information

2 : List of students play both cricket and badminton

3 : List of students play either cricket or badminton but not both

4 : Number of students play neither cricket nor badminton

5 : Number of students play cricket and football but not badminton

6 : Exit

Enter your choice : 2

Group of Students who play Cricket = { aaa, bbb, ccc, ddd }

Group of Students who play Badminton = { eee, bbb }

Group of Students who play both Cricket and Badminton = { bbb }

1 : Accept the Information

2 : List of students play both cricket and badminton

3 : List of students play either cricket or badminton but not both

4 : Number of students play neither cricket nor badminton

5 : Number of students play cricket and football but not badminton

6 : Exit

Enter your choice : 3

Group of Students who play Cricket = { aaa, bbb, ccc, ddd }

Group of Students who play Badminton = { eee, bbb }

Group of Students who play either cricket or badminton but not both = { aaa, ccc, ddd, eee }

1 : Accept the Information

2 : List of students play both cricket and badminton

3 : List of students play either cricket or badminton but not both

4 : Number of students play neither cricket nor badminton

5 : Number of students play cricket and football but not badminton

6 : Exit

Enter your choice : 4

Group of Students who play Cricket = { aaa, bbb, ccc, ddd }

Group of Students who play Badminton = { eee, bbb }

Group of Students who play Football = { www, eee, ttt, aaa, ccc, rrr }

Group of Students who play neither cricket nor badminton = { www, ttt, rrr }

Number of students who play neither cricket nor badminton = 3

1 : Accept the Information

2 : List of students play both cricket and badminton

3 : List of students play either cricket or badminton but not both

4 : Number of students play neither cricket nor badminton

5 : Number of students play cricket and football but not badminton

6 : Exit

Enter your choice : 5

Group of Students who play Cricket = { aaa, bbb, ccc, ddd }

Group of Students who play Football = { www, eee, ttt, aaa, ccc, rrr }

Group of Students who play Badminton = { eee, bbb }

Group of Students who play cricket and football but not badminton = { aaa, ccc }

Number of students who play cricket and football but not badminton = 2

1 : Accept the Information

2 : List of students play both cricket and badminton

3 : List of students play either cricket or badminton but not both

4 : Number of students play neither cricket nor badminton

5 : Number of students play cricket and football but not badminton

6 : Exit

Enter your choice : 6

End of Program