Modern Education Society's

College of Engineering, Pune

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SEMESTER/YEAR: III sem	**ROLL NO: F2011040**
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TITLE : PERFORM VARIOUS OPERATIONS ON ARRAY

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.

(Note- While realizing the group, duplicate entries should be avoided, do not use SET built-in functions)

OBJECTIVES:

1. To understand structure of Array.
2. To understand How Create, Display and perform various operations on array.

OUTCOMES:

1. To analyze the problems to apply suitable algorithm and data structure.
2. To discriminate the usage of various data structures in approaching the problem solution.
3. To understand concept of linear data structure

PRE-REQUISITES:

1. Knowledge of python programming
2. Knowledge of array

APPARATUS:

```python
c = list(map(int, input('enter roll no. who play cricket :').split()))
b = list(map(int, input('enter roll no. who play badminton :').split()))
f = list(map(int, input('enter roll no. who play football :').split()))

it=[]
cb=[]
u=[]
f_o=[]
def union(c,b,f):
    for i in c:
        if i not in u:
            u.append(i)
    for j in b:
        if j not in u:
            u.append(j)
    for k in f:
        if k not in u:
            u.append(k)

union(c,b,f)


def intersection(c,b):
    #finding intersection between cricket and badminten
    intersection=0
    global it
    for i in c:
        for j in b:
            if i==j:
                intersection+=1
                it.append(i)
    print('there are {} student who play both criket and badminton'.format(intersection))
    print('student who play both criket and badminton',it)
def cricket_badminton(c,b):
    #finding student who play either cricket or badminton but not both
    global it
    global cb

    for i in c:
        if i not in cb:
            cb.append(i)
    for j in b:
        if j not in cb:
            cb.append(j)
    for k in cb:
        if k in it:
            cb.remove(k)


    print('student who play either cricket or badminton but not both:',end=' ')
    print(cb)




def football(c,b):
    # finding student who neither play cricket nor badminton
    for p in u:
        if p not in c and p not in b:
            f_o.append(p)
    print('student who neither play cricket nor badminton',f_o)

def c_f_notB(c,b,f):
    cfo=u
```

```
    for i in u:
        if i in c and i in f:
            cfo.append(i)
    for j in cfo:
        if j in b:
            cfo.remove(j)

    print('student who play cricket and football but not badminton are',cfo)


while True:
    print('**********************MAIN MENU*************************')
    print('1.list of student who play both cricket and badminton\n'
          '2.list of student who play either cricket or badminton but not both\n'
          '3.no of student who play neither cricket nor badminton\n'
          '4.no of student who play cricket and football but not badminton ')
    ch=int(input('enter choice'))
    print('#####################################################################')
    print('*********************************************************************')

    if ch==1:
        intersection(c, b)
        break
    if ch==2:
        cricket_badminton(c, b)
        break
    if ch==3:
        football(c,b)
        break
    if ch==4:
        c_f_notB(c, b, f)
        break
```

Output:

```
C:\Users\sspab\PycharmProjects\new\venv\Scripts\python.exe "C:/Users/sspab/PycharmProjects/new/sem  3/FDS Q1.p
enter roll no. who play cricket :1 2 3 4 5
enter roll no. who play badminton :4 5 6 7 8
enter roll no. who play football :5 6 8 10
**********MAIN MENU**********
1.list of student who play both cricket and badminton
2.list of student who play either cricket or badminton but not both
3.no of student who play neither cricket nor badminton
4.no of student who play cricket and football but not badminton
enter choice1
######################################################################
**********
there are 2 student who play both criket and badminton
student who play both criket and badminton [4, 5]

Process finished with exit code 0
```

```
C:\Users\sspab\PycharmProjects\new\venv\Scripts\python.exe "C:/Users/sspab/PycharmProjects/new/sem
enter roll no. who play cricket :1 2 3 4 5
enter roll no. who play badminton :3 4 5 6 7
enter roll no. who play football :5 6 7 8 9
**********MAIN MENU**********
1.list of student who play both cricket and badminton
2.list of student who play either cricket or badminton but not both
3.no of student who play neither cricket nor badminton
4.no of student who play cricket and football but not badminton
enter choice2
######################################################################
**********
student who play either cricket or badminton but not both: [1, 2, 3, 4, 5, 6, 7]
```

```
C:\Users\sspab\PycharmProjects\new\venv\Scripts\python.exe "C:/Users/sspab/PycharmProjects/new
enter roll no. who play cricket :1 2 3 4 5
enter roll no. who play badminton :3 4 5 6
enter roll no. who play football :5 6 7 8 9
**********MAIN MENU**********
1.list of student who play both cricket and badminton
2.list of student who play either cricket or badminton but not both
3.no of student who play neither cricket nor badminton
4.no of student who play cricket and football but not badminton
enter choice3
######################################################################
**********
student who neither play cricket nor badminton [7, 8, 9]
```

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Q1. What is structure?

Ans: A structure is a user-defined data type in c++. A structure creates a data type that can be used to group items of possibly different types into a single type. The 'struct' keyword is used to create a structure. The general syntax to create a structure is as shown below.

```
struct  NameOfStructure {
    member 1 ;
    member 2 ;
    .
    .
    member N ;
};
```

Structures in C++ can contain two types of members:

- Data Member:

  These members are normal c++ variables. We can create a structure with variables of different data types in c++.

- Member function:

  These members are normal c++ functions. Along with variables, we can also include functions inside a structure declaration.

2. How to delete an element from array?

Ans: Deleting refers to removal of an element from an Array, without effecting the sequence of the other elements.
To do so we want to overwrite or copy next element to same position from which we want to delete a element. Then repeating the same thing with next elements of a array upto last element.
From the above explanation we can develope algorithm like given below.

Algorithm:

1. find the given element in the given array and store the index.
2. If the element found,
   Shift all the elements from index+1 by 1 position to the left.
   Reduce the array size by 1.
3. else, print "element not found".