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Class: SE1 Subject: DSL.

Roll No: 21123.

Problem statement:

In second year engineering group. A student play cricket group B students play Badminton and group C studer play football. write a python program using function to compute following

(a) list of student who play either cricket or badminton.

(b) List of student who play either cricket or badminton.

(c) No. of student who play neither cricket nor badminton

(d) No. of student who play cricket and football but not badminton.

Learning objective:

1) To implement set operation and to understand the concept and operation of set.

2) To understand the primitive function of list.

3) To understand how built-in function works.

Learning outcomes:

1) To write menu driven modular program in python.

2) To implement set operation using List data structure in python.

3) To implement user defined function in python.

Software requirement:

Pycharm 64.

Hardware Requirement.

OS Name - Microsoft window 10.

Version -

OS manufactures - Microsoft

System type - 64 bit operation system, x64 based processor

System manufactures - Legion Lenovo Computer.

Processor - Intel(R) Core i5 - 9300HF CPU @ 2.40GHZ, 2.40GHZ.

Theory:

1) set: A set is collection of well defined, distinct objects The concept of set is being used to define concept of relations and function. The set is being used in every branch of mathematics set operation used to solve problems, are union, intesection and set difference of sets.

2) class:

A class is user define data type which contains some data and code to manipulate that data once a class is defined, we can create instances known as object belonging to that class. object can access data member and member function defined inside class.

3) List:

A List is versatile data type in python. A list consist of items seperated by comma and enclosed with square brackets values stored in lists are accessed using indices. The index of first element is 0 and index of last element is (n-1) where n is total Number of element in list.

Algorithm:

1) Intersection of sets:

1) start.
2) Take inputs as list1 and list 2 whose intersection must be found.
3) Make an empty list a.
4) Read the element present in list 1.
5) If the element is present in the list2 also append it in list a
6) Repeat steps 4 & 5 for every elements in list1.
7) Return the list a.
8) Stop.

2) Union of sets:

1) start
2) Take inputs as list1 and list2 whose union need to be found.
3) make list a which is copy of list1.
4) Read element present in list 2.
5) ~~Repeat~~ If element is not present in list a then only append it. If it is present, don't append.
6) Repat steps 4 & 5 for every element in list2.
7) Return the required list a.
8) Stop.

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3) Set difference.

1) Start.
2) Take inputs as list1 and list2 whose difference we need to found.
3) Make list a which is copy of list1.
4) Read the element in list1
5) If the element is also present in list 2 remove it from list a.
6) Repeat steps 4&5 for every element in list1.
7) Return list a.
8) Stop.

Pseudocode:

1] Algorithm Intersection (list1, list2)

① Start
② Intersection of list = [ ]
③ for element in list1:
    if element in list2:
        list a.append(element)
    Return list a.
④ stop.

2] union (list1, list2)

① Start
② list a = list2.
③ for element in list1:
    if element not in list2:
        list.append(element)
    Return list a
④ stop.

3] Algorithm subtraction(list1, list2)

① Start

② subtraction list = list1.cpy()

③ For element in list1:

If element in list2:

subtract List.remove(element)

Return subtraction list4.

④ Stop.

(1) List of student who play both cricket and badminton.

① print Intersection(cricket, badminton)

(2) List of student who play either cricket or badminton but not both

① ~~print~~ make-list = Union(cricket, badminton)

② make-list = Intersection(cricket, badminton)

③ print Union(cricket, badminton).

```
football = []
badminton = []
cricket = []



# a function of making list of all the rollno that play the sport!!
def make_list(lista, players):
    print("enetr the roll no. of students: ")
    i=0
    for i in range(players):
        x = int(input())
        if x not in lista:
            lista.append(x)
            #print(lista)
    return lista

# function of union of two list
def union_list(list1, list2):
    lista = list2
    for element in list1:
        if element not in list2:
            lista.append(element)
    return lista



#  intersection of two lists
def intersection_list(list1,list2):
    lista = []
    for element in list1:
        if element in list2:
            lista.append(element)
    return lista
```

```
print("##MENU##")

print("\n1.number ofStudents playing cricket and badminton \n2.List of Students playing cricket or badminton but not both")

print("\n3.Number of students playing neither cricket nor badminton \n4.Number of students playing cricket and football but not badminton")

result_list2=[]

result_list3=[]

result_list4=[]


num1 = int(input("number of students play fooyball:  "))

print("FOOTBALL: ",make_list(football,num1))

#make_list(football, num1)

num2 = int(input("number of students play cricket:  "))     #length of the list

print("CRICKET: ",make_list(cricket,num2))

#make_list(cricket, num2)

num3 = int(input("number of students play badminton:  "))

print("BADMINTON: ",make_list(badminton,num3))

#make_list(badminton, num3)




while (True):
   choice = int(input("Enter choice:"))
   if (choice == 1):
      print("The students who play both cricket and Badminton are :", intersection_list(cricket, badminton))


   elif (choice == 2):
      print("The students that play either of the the two but not both are :")
      for element in cricket:
         if element not in badminton:
```

```
            result_list2.append(element)
    for element in badminton:
        if element not in cricket:
            result_list2.append(element)
    print(result_list2)

elif (choice == 3):
    for element in football:
        if element not in cricket:
            if element not in badminton:
                result_list3.append(element)
    print(result_list3)

elif (choice == 4):
    for element in union_list(cricket,football):
        if element not in badminton:
            result_list4.append(element)
    print(result_list4)
else:
    print("Enter the  choice in range!!")
stop = input("would you like to continue(y/n):")
if (stop == "n"):
    break
```

OUTPUT:

1.number ofStudents playing cricket and badminton

2.List of Students playing cricket or badminton but not both

3.Number of students playing neither cricket nor badminton

4.Number of students playing cricket and football but not badminton

number of students play fooyball: 4

```
enetr the roll no. of students:
2
4
5
6
FOOTBALL:  [2, 4, 5, 6]
number of students play cricket:  3
enetr the roll no. of students:
1
2
3
CRICKET:  [1, 2, 3]
number of students play badminton:  4
enetr the roll no. of students:
1
3
4
5
BADMINTON:  [1, 3, 4, 5]
Enter choice:1
The students who play both cricket and Badminton are : [1, 3]
would you like to continue(y/n):Y
Enter choice:2
The students that play either of the the two but not both are :
[2, 4, 5]
would you like to continue(y/n):Y
Enter choice:3
[6]
```

would you like to continue(y/n):Y

Enter choice:4

[2, 6]

would you like to continue(y/n):N

Enter choice: