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//DSL Lab 01 Set



# remove duplicate
def removeDuplicate(d):
    lst=[]
    for i in d:
        if i not in lst:
            lst.append(i)
    return lst


#  (A&B)
def intersection(lst1,lst2):
    lst3=[]
    for val in lst1:
        if val in lst2:
            lst3.append(val)
    return lst3


# (A|B)
def union(lst1,lst2):
    lst3=lst1.copy()
    for val in lst2:
        if val not in lst3:
            lst3.append(val)
    return lst3


# (A-B)
def diff(lst1,lst2):
    lst3=[]
    for val in lst1:
        if val not in lst2:
            lst3.append(val)
    return lst3


# symmetric difference of two sets (A^B)
def sym_diff(lst1,lst2):
    lst3=[]
    D1=diff(lst1,lst2)
    D2=diff(lst2,lst1)
    lst3=union(D1,D2)
    return lst3


#both cricket and badminton
def CB(lst1,lst2):
    lst3=intersection(lst1,lst2)
    print("Students who play both cricket and badminton is/are: ", lst3)
    return len(lst3)
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#either cricket or badminton but not both
def eCeB(lst1,lst2):
    lst3=sym_diff(lst1,lst2)
    print("Students who play either cricket or badminton but not both is/are:
",lst3)
    return len(lst3)


#neither cricket nor badminton
def nCnB(lst1,lst2,lst3):
    CorB = union(lst2, lst3)
    lst4=diff(union(lst1,CorB),union(lst2,lst3))
    print("Students who play neither cricket nor badminton is/are: ",lst4)
    return len(lst4)


#cricket and football but not badminton
def CBnF(lst1,lst2,lst3):
    lst4=diff(union(lst1,lst2),lst3)
    print("Students who play cricket and football but not badminton is/are:
",lst4)
    return len(lst4)


#Cricket
Cricket = []
n = int(input("\nEnter number of students who play cricket : "))
for i in range(0, n):
    ele = input(str(i+1)+"."+"\t")
    Cricket.append(ele)
Cricket=removeDuplicate(Cricket)



#Badminton
Badminton = []
n = int(input("\nEnter number of students who play badminton : "))
for i in range(0, n):
    ele = input(str(i+1)+"."+"\t")
    Badminton.append(ele)
Badminton=removeDuplicate(Badminton)



#Football
Football = []
n = int(input("\nEnter number of students who play football : "))
for i in range(0, n):
    ele = input(str(i+1)+"."+"\t")
    Football.append(ele)
Football=removeDuplicate(Football)



print("\nStudents who play cricket: " +str(Cricket))
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print("Number of students who play cricket: " +str(len(Cricket)))
print("Students who play badminton: " +str(Badminton))
print("Number of students who play badminton: " +str(len(Badminton)))
print("Students who play football: " +str(Football))
print("Number of students who play football: " +str(len(Football)))
print("\nResults: ")
CB(Cricket,Badminton)
eCeB(Cricket, Badminton)
nCnB(Football,Cricket,Badminton)
CBnF(Cricket,Football,Badminton)
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