ASSINGMENT 3 :

Problem Statement : Set Operations

Write a Python program to take two sets, A (students who play cricket) and B (students who play badminton), and use set operations to:

A. Find and display the set of students who play either cricket or badminton or both.

B. Find and display the set of students who play both cricket and badminton.s

C. Find and display the set of students who play only cricket.

D. Find and display the set of students who play only badminton.

E. find out how many students play neither cricket nor badminton.

CODE:

def display\_set(title, s):

print(title)

if s:

for item in s:

print(item)

else:

print("None")

print()

def find\_either\_or\_both(A, B):

return A.union(B)

def find\_both(A, B):

return A.intersection(B)

def find\_only\_cricket(A, B):

return A.difference(B)

def find\_only\_badminton(B, A):

return B.difference(A)

def find\_neither(A, B, total\_students):

either\_or\_both = A.union(B)

return total\_students - len(either\_or\_both)

def main():

A = set()

B = set()

total\_students = int(input("Enter the total number of students in the class: "))

num\_cricket = int(input("Enter the number of students who play cricket: "))

print("Enter the names of students who play cricket:")

for \_ in range(num\_cricket):

A.add(input())

num\_badminton = int(input("Enter the number of students who play badminton: "))

print("Enter the names of students who play badminton:")

for \_ in range(num\_badminton):

B.add(input())

either\_or\_both = find\_either\_or\_both(A, B)

both = find\_both(A, B)

only\_cricket = find\_only\_cricket(A, B)

only\_badminton = find\_only\_badminton(B, A)

neither = find\_neither(A, B, total\_students)

display\_set("Students who play either cricket or badminton or both:", either\_or\_both)

display\_set("Students who play both cricket and badminton:", both)

display\_set("Students who play only cricket:", only\_cricket)

display\_set("Students who play only badminton:", only\_badminton)

print("Number of students who play neither cricket nor badminton:", neither)

if \_\_name\_\_ == "\_\_main\_\_":

main()

OUTPUT

Enter the total number of students in the class: 10

Enter the number of students who play cricket: 4

Enter the names of students who play cricket:

John

Jane

Tom

Alice

Enter the number of students who play badminton: 4

Enter the names of students who play badminton:

Jane

Tom

Mike

Sara

Students who play either cricket or badminton or both:

John

Jane

Tom

Alice

Sara

Mike

Students who play both cricket and badminton:

Jane

Tom

Students who play only cricket:

John

Alice

Students who play only badminton:

Sara

Mike

Number of students who play neither cricket nor badminton: 4