**Experiment No 9**

**Program 1:** Write a Python program to store the information of a student cell number in the form of a set.

**Code:**

phonebook1 = {'123-45-67', '234-56-78', '345-67-89','123-45-67', '345-

67-89'}

print (phonebook1)

set\_len = len (phonebook1)

print ("The length of phonebook1 is:", set\_len)

print ("The given phonebook1 is:", phonebook1)

**Output:**

{'123-45-67', '345-67-89', '234-56-78'}

The length of phonebook1 is: 3

The given phonebook1 is: {'123-45-67', '345-67-89', '234-56-78'}

**Program 2:** Write a Python program to store mix data in the form of a set.

**Code:**

mix\_data = {'Usman Institute of Technology', 17.5, (1,2,3,4,5,6)}

print(mix\_data)

set\_len = len(mix\_data)

print ("The length of mix data is:",set\_len)

**Output:**

{17.5, 'Usman Institute of Technology', (1, 2, 3, 4, 5,6)}

The length of mix data is: 3

**Program 3:** Write a program to initialize two different sets one consists the data elements for Data Scientist and other set for Data Engineer. You can use list with explicitly type casting of set().

**Code:**

dataScientist = set(['Python', 'R', 'SQL', 'Git', 'Tableau', 'SAS'])

dataEngineer = set(['Python', 'Java', 'Scala', 'Git', 'SQL',

'Hadoop'])

print ("For a Data Scientist specialization you need:", dataScientist)

print ("For a Data Engineer specialization you need:", dataEngineer)

**Output:**

For a Data Scientist specialization you need: {'SAS', 'Git', 'SQL', 'Python', 'Tableau', 'R'}

For a Data Engineer specialization you need: {'Scala', 'Git', 'SQL', 'Python', 'Java', 'Hadoop'}

**Program 4:** Write a program which will initialize an empty set and similarly initialize two dictionaries with two different methods.

**Code:**

My\_empty\_set = set() My\_empty\_dictionary1= dict() My\_empty\_dictionary2 = {}

print(My\_empty\_set) print(My\_empty\_dictionary1) print(My\_empty\_dictionary2)

**Output:**

set()

{}

{}

**Program 5:** Write a program which will have some top scoring students in a set. Now add some new values inside a set, using add method.

**Code:**

My\_topStudents = {'Bassam','Usman','Rafeh', 'Ahad', 'Wadood','Yusra',

'Asma'}

print('My top scoring students in Programming fundamentals are:', My\_topStudents)

print('Oh, I guess I miss one student, let me add his name too') print('Previously I have added :'+ str(len(My\_topStudents)) +' students in my list')

My\_topStudents.add('Khurram')

print('Thanks, I have remember him')

print('Now my top scoring students names are :', My\_topStudents) print('Now after adding I have :'+ str(len(My\_topStudents)) +' students in my list')

**Output:**

My top scoring students in Programming fundamentals are: {'Yusra', 'Bassam', 'Rafeh', 'Wadood', 'Usman', 'Asma', 'Ahad'}

Oh, I guess I miss one student, let me add his name too

Previously I have added :7 students in my list

Thanks, I have remember him

Now my top scoring students names are : {'Yusra', 'Khurram', 'Bassam', 'Rafeh', 'Wadood', 'Usman', 'Asma', 'Ahad'}

Now after adding I have :8 students in my list

**Program 6:** Write a program which will remove some information from the exiting set. Use a method remove to remove an element from a set

**Code:**

My\_topStudents = {'Bassam','Usman','Rafeh', 'Ahad', 'Wadood','Yusra',

'Asma'}

print('My top scoring students in Programming fundamentals are:', My\_topStudents)

print('Oh, I guess I miss one student, let me add his name too')

print('Previously I have added :'+ str(len(My\_topStudents)) +' students in my list')

My\_topStudents.add('Khurram Khalil') My\_topStudents.add('Khurram Khan') print('Thanks, I have remember him')

print('Now my top scoring students names are :', My\_topStudents) print('Now after adding I have :'+ str(len(My\_topStudents)) +' students in my list')

print('Oh, I guess I have added one student with similar name, let me remove his name.')

My\_topStudents.remove('Khurram Khalil')

print('Now my top scoring students names after removing extra name are

:', My\_topStudents)

print('Now after removing I have :'+ str(len(My\_topStudents)) +'

students in my list')

**Output:**

My top scoring students in Programming fundamentals are: {'Ahad', 'Bassam', 'Asma', 'Wadood', 'Yusra', 'Usman', 'Rafeh'}

Oh, I guess I miss one student, let me add his name too

Previously I have added :7 students in my list

Thanks, I have remember him

Now my top scoring students names are : {'Ahad', 'Bassam', 'Asma', 'Khurram Khalil', 'Wadood', 'Yusra', 'Khurram Khan', 'Usman', 'Rafeh'}

Now after adding I have :9 students in my list

Oh, I guess I have added one student with similar name, let me remove his name.

Now my top scoring students names after removing extra name are: {'Ahad', 'Bassam', 'Asma', 'Wadood', 'Yusra', 'Khurram Khan', 'Usman', 'Rafeh'}

Now after removing I have :8students in my list

**Program 7**: Write a program which will remove some information from the exiting set. Use a method discard to remove an element from a set.

**Code:**

My\_topStudents = {'Bassam','Usman','Rafeh', 'Ahad', 'Wadood','Yusra',

'Asma'}

print('My top scoring students in Programming fundamentals are:', My\_topStudents)

print('Oh, I guess I miss one student, let me add his name too') print('Previously I have added :'+ str(len(My\_topStudents)) +' students in my list')

My\_topStudents.add('Khurram Khalil')

My\_topStudents.add('Khurram Khan')

print('Thanks, I have remember him')

print('Now my top scoring students names are :', My\_topStudents) print('Now after adding I have :'+ str(len(My\_topStudents)) +' students in my list')

print('Oh, I guess I have added one student with similar name, let me remove his name.')

My\_topStudents.remove('Khurram Khalil')

print('Now my top scoring students names after removing extra name are:', My\_topStudents)

print('Now after removing I have :'+ str(len(My\_topStudents)) +'

students in my list') My\_topStudents.discard('Khurram Khalil')

print('Now my top scoring students names after removing extra name are

:', My\_topStudents)

print('Now after removing I have :'+ str(len(My\_topStudents)) +' students in my list')

**Output:**

My top scoring students in Programming fundamentals are: {'Wadood', 'Bassam', 'Rafeh', 'Ahad', 'Asma', 'Yusra', 'Usman'}

Oh, I guess I miss one student, let me add his name too

Previously I have added :7 students in my list

Thanks, I have remember him

Now my top scoring students names are : {'Wadood', 'Khurram Khan', 'Bassam', 'Khurram Khalil', 'Rafeh', 'Ahad', 'Asma', 'Yusra', 'Usman'}

Now after adding I have :9 students in my list

Oh, I guess I have added one student with similar name, let me remove his name.

Now my top scoring students names after removing extra name are: {'Wadood', 'Khurram Khan', 'Bassam', 'Rafeh', 'Ahad', 'Asma', 'Yusra', 'Usman'}

Now after removing I have :8students in mylist

Now my top scoring students names after removing extra name are: {'Wadood', 'Khurram Khan', 'Bassam', 'Rafeh', 'Ahad', 'Asma', 'Yusra', 'Usman'}

Now after removing I have :8 students in my list

**Program 8:** Use pop() to remove the key and its item from the exiting set.

**Code:**

My\_topStudents = {'Bassam','Usman','Rafeh', 'Ahad', 'Wadood','Yusra',

'Asma'}

print('My top scoring students in Programming fundamentals are:',

My\_topStudents)

print('Oh, I guess I miss one student, let me add his name too') print('Previously I have added :'+ str(len(My\_topStudents)) +' students in my list')

My\_topStudents.add('Khurram Khalil') My\_topStudents.add('Khurram Khan') print('Thanks, I have remember him')

print('Now my top scoring students names are :', My\_topStudents) print('Now after adding I have :'+ str(len(My\_topStudents)) +' students in my list')

print('Oh, I guess I have added one student with similar name, let me remove his name.')

My\_topStudents.remove('Khurram Khalil')

print('Now my top scoring students names after removing extra name are

:', My\_topStudents)

print('Now after removing I have :'+ str(len(My\_topStudents)) +' students in my list')

My\_topStudents.discard('Khurram Khalil')

print('Now my top scoring students names after removing extra name are

:', My\_topStudents)

print('Now after removing I have :'+ str(len(My\_topStudents)) +' students in my list')

My\_topStudents.pop()

print('Now my top scoring students names after removing extra name are

:', My\_topStudents)

print('Now after removing I have :'+ str(len(My\_topStudents)) +'

students in my list')

**Output:**

My top scoring students in Programming fundamentals are: {'Rafeh', 'Ahad', 'Yusra', 'Wadood', 'Bassam', 'Usman', 'Asma'}

Oh, I guess I miss one student, let me add his name too

Previously I have added :7 students in my list

Thanks, I have remember him

Now my top scoring students names are : {'Rafeh', 'Ahad', 'Yusra', 'Khurram Khan', 'Wadood', 'Bassam', 'Usman', 'Asma', 'Khurram Khalil'}

Now after adding I have :9 students in my list

Oh, I guess I have added one student with similar name, let me remove his name.

Now my top scoring students names after removing extra name are: {'Rafe

h', 'Ahad', 'Yusra', 'Khurram Khan', 'Wadood', 'Bassam', 'Usman', 'Asma'}

Now after removing I have :8 students in my list

Now my top scoring students names after removing extra name are: {'Rafeh', 'Ahad', 'Yusra', 'Khurram Khan', 'Wadood', 'Bassam', 'Usman', 'Asma'}

Now after removing I have :8 students in my list

Now my top scoring students names after removing extra name are: {'Ahad', 'Yusra', 'Khurram Khan', 'Wadood', 'Bassam', 'Usman', 'Asma'}

Now after removing I have :7students in my list

**Program 9:** Write a program which will clear the set from all the existing elements inside the set.

**Code:**

My\_topStudents = {'Bassam','Usman','Rafeh', 'Ahad', 'Wadood','Yusra',

'Asma'}

print('My top scoring students in Programming fundamentals are:',

My\_topStudents)

print('Lets clear this list and prepare new list for the final exams') My\_topStudents = My\_topStudents.clear()

print('Now after clearing the set I have :', My\_topStudents)

**Output:**

My top scoring students in Programming fundamentals are: {'Asma', 'Rafeh', 'Wadood', 'Bassam', 'Ahad', 'Yusra', 'Usman'}

Lets clear this list and prepare new list for the final exams

Now after clearing the set I have : None

**Program 10:** Write a program that will operate on phonebook1 and phonebook3 for union, intersection, difference and symmetric difference.

**Code:**

phonebook1 = {'123-45-67', '234-56-78', '345-67-89','123-45-67', '345-

67-89'}

phonebook3 = {'345-67-89','456-78-90'}

print("Phonebook1 is :",phonebook1)

print("Phonebook3 is :",phonebook3)

print("The Union of Phonebook1 and Phonebook3:",phonebook1 |

phonebook3)

print("The Union of Phonebook3 and Phonebook1:",phonebook3 |

phonebook1)

print("The Intersection of Phonebook1 and Phonebook3:",phonebook1 & phonebook3)

print("The Intersection of Phonebook3 and Phonebook1:",phonebook3 & phonebook1)

print("The Difference Between Phonebook1 and Phonebook3:",phonebook1 - phonebook3)

print("The Difference Between Phonebook3 and Phonebook1:",phonebook3 - phonebook1)

print("The Symmetric Difference Between Phonebook1 and

Phonebook3:",phonebook1 ^ phonebook3)

print("The Symmetric Difference Between Phonebook3 and

Phonebook1:",phonebook3 ^ phonebook1)

**Output:**

Phonebook1 is : {'234-56-78', '345- 67 - 89', '123-45-67', '345-67-89'}

Phonebook3 is : {'456-78-90', '345-67-89'}

The Union of Phonebook1 and Phonebook3: {'234-56-78', '456-78-90', '345- 67 - 89', '123-45-67', '345-67-89'}

The Union of Phonebook3 and Phonebook1: {'234-56-78', '456-78-90', '345- 67 - 89', '123-45-67', '345-67-89'}

The Intersection of Phonebook1 and Phonebook3: {'345-67-89'}

The Intersection of Phonebook3 and Phonebook1: {'345-67-89'}

The Difference Between Phonebook1 and Phonebook3: {'234-56-78', '345- 67 - 89', '123-45-67'}

The Difference Between Phonebook3 and Phonebook1: {'456-78-90'}

The Symmetric Difference Between Phonebook1 andPhonebook3: {'456-78-90', '234-56-78', '345- 67 - 89', '123-45-67'}

The Symmetric Difference Between Phonebook3 andPhonebook1: {'456-78-90', '234, 56-78', '345- 67 - 89' '123-45-67'}

***Programming Exercise***

1. Write a program which will add your best five students name in a set. You will use a loop to insert names in set.

**Input:**

set1=set()  
for i in range(5):  
 names=input("enter student name")  
 set1.add(names)  
print("best five students name:",set1)

**Output:**

enter student namemaha

enter student namesana

enter student namemavia

enter student nameali

enter student namesara

best five students name: {'ali', 'maha', 'sana', 'sara', 'mavia'}

2.Write a program which will remove 2 friends who left UIT.

**Input:**

set1={"maha","sara","ali","sana","zain"}

print(set1)

set1.remove("maha")

set1.remove("sana")

print("2 friends who left UIT:",set1)

**Output:**

{'maha', 'ali', 'zain', 'sana', 'sara'}

2 friends who left UIT: {'ali', 'zain', 'sara'}

3.Write a program which will add your best dishes and then pop one by one until the set is empty.

**Input:**

set1=set()

for i in range(4):

dishes=input(("dish name:"))

set1.add(dishes)

print("best dishes name",set1)

def remove\_element(set1):

while set1:

set1.pop()

print(set1)

remove\_element(set1)

**Output:**

dish name:biryani

dish name:noodles

dish name:pizza

dish name:burger

best dishes name {'noodles', 'biryani', 'burger', 'pizza'}

{'biryani', 'burger', 'pizza'}

{'burger', 'pizza'}

{'pizza'}

set()

4. Write a program which will store number of items in a set after each purchasing the items will be pop from the set and compare its price at the end program will give you the total amount of items have been sold. Also find the max amount and minimum amount of items sold.

**Input:**

set1={"perfumes","chips","frocks","makeup kit","toys"}

dict1={}

list1=[]

for i in range(len(set1)):

s2=set1.pop()

print("the price of",s2,"is:")

dict1 [s2]=input("price")

print(dict1)

for x in dict1.values():

list1.append(x)

print(list1)

print("the max price of an item is{}:".format(max(list1)))

print("the min price of an item is{}:".format(min(list1)))

**Output:**

the price of perfumes is:

price 789

the price of frocks is:

price 3000

the price of chips is:

price50

the price of makeup kit is:

price1000

the price of toys is:

price 500

{'perfumes': ' 789 ', 'frocks': ' 3000', 'chips': '50', 'makeup kit': '1000 ', 'toys': ' 500'}

[' 789 ', ' 3000', '50', '1000 ', ' 500']

the max price of an item is:50

the min price of an item is:3000

5. Write a program which will compare two sets, Set A and Set B. Both the sets have some students who love to play one is hockey and other one is cricket. 10 of them play both. Now using sets find how many of them are playing cricket only, if universal set is 40, students who play hockey are 21.

**Input:**

universal\_set=set(range(1,41))  
play\_hockey=set(range(1,22))  
play\_both=set(range(1,11))  
print("students who are interested in playing cricket only are",len(universal\_set)-len(play\_hockey))

**Output:**

students who are interested in playing cricket only are 19

6. A pet store keeps track of the purchases of customers over a four-hour period. The store manager classifies purchases as containing a dog product, a cat product, a fish product, or product for a different kind of pet. She found.

a. 83 purchased a dog product

b. 101 purchased a cat product

c. 22 purchased a fish product

d. 31 purchased a dog and a cat product e. 8 purchased a dog and a fish product

f. 10 purchased a cat and a fish product

g. 6 purchased a dog, a cat and a fish product

h. 34 purchased a product for a pet other than a dog, cat or a fish.

i. How many purchases were for a dog product only?

ii. How many purchases were for cat product only? iii. How many purchases for a dog or a fish product? iv. How many purchases were there in total?

Dog Cat

Fish

**Input:**

dog\_fish\_cat=set(range(1,7))  
nothing=set(range(1,35))  
dog\_cat=len(set(range(1,32)))-len(dog\_fish\_cat)  
dog\_fish=len(set(range(1,8)))-len(dog\_fish\_cat)  
cat\_fish=len(set(range(1,10)))-len(dog\_fish\_cat)  
purchased=dog\_cat+dog\_fish+cat\_fish  
dog\_only=purchased-cat\_fish

print("the number of customers for the dog product only are:",(dog\_only))  
cat\_only=purchased-dog\_fish

print("the number of customers for the cat product only are:",(cat\_only))  
fish\_only=purchased-dog\_cat dog\_or\_fish=dog\_only+fish\_only+dog\_fish+cat\_fish+len(dog\_fish\_cat)  
print("the number of customers for the purchased of dog or fish product are:",(dog\_or\_fish))  
total\_purchased=dog\_fish+cat\_only+len(nothing)  
print("the total purchased becomes:",total\_purchased)

**Output:**

the number of customers for the dog product only are: 26

the number of customers for the cat product only are: 28

the number of customers for the purchased of dog or fish product are: 40

the total purchased becomes: 63

7. Solve the following problem of real world.

A camp of international students has 110 students, as shown in the diagram. The diagram will elaborate that all the students speak some kind of a language. We need to find out how many that speak none of them out of 110 students.

Find how many students speak

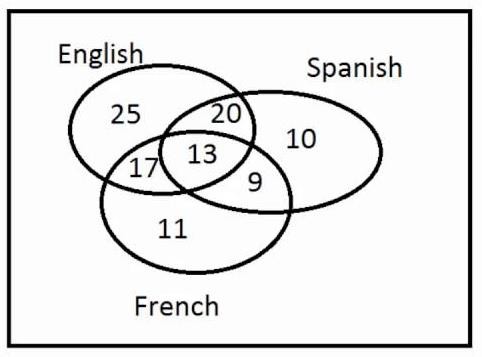
a. English and Spanish but not French?

b. Neither English, Spanish, nor French?

c. French, but neither English nor Spanish?

d. Only one of the three languages?

e. Exactly two of the three languages?



**Input:**

eng=set(range(25))

span=set(range(10))

french=set(range(11))

eng\_span=set(range(20))

eng\_french=set(range(17))

span\_french=set(range(9))

eng\_span\_french=set(range(13))

total\_students=set(range(110))

neither\_three=set(range(5))

print("the students speaking english and spanish but not french are:",len(eng\_span))

print("the no of students who can speak neither eng,spanish nor french are:",len(neither\_three))

print("the no of students who can speak french are:",len(french))

print("the no of students who can speak one of 3 languages are:",len(eng)+len(span)+len(french))

print("the no of students who can speak exactly 2 of 3 languages are:",len(eng\_french)+len(eng\_span)+len(span\_french))

**Output:**

the students speaking english and spanish but not french are: 20

the no of students who can speak neither eng,spanish nor french are: 5

the no of students who can speak french are: 11

the no of students who can speak one of 3 languages are: 46

the no of students who can speak exactly 2 of 3 languages are: 46