Practical no 2:

To create ADT that implements the "set" concept

a) Add (new element) - place a value into a set

b) Remove (element) - remove the value

c) Contains (element) - return true if element is in a collection

d) Size () - return number of values in collection iterator() return an iterator used to loop over collection

e) Intersection of two sets.

f) Union of two set

g) Difference between two sets

h) Subset

Pre-requisite

Knowledge of Python programming

Knowledge of STL, set operations

Objective

To understand how Create, Display and perform various operations on set.

Input

Set A elements and Set B elements

Output

As per set operations

Description:

What is abstract data type?

An abstract data type is an abstraction of a data structure that provides only the interface to which the data structure must adhere. The interface does not give any specific details about something should be implemented or in what programming language.

Python Set

A Python set is the collection of the unordered items. Each element in the set must be unique, immutable, and the sets remove the duplicate elements. Sets are mutable which means we can modify it after its creation**.**

Set (): Creates a new set initialized to the empty set.

Length (): Returns the number of elements in the set, also known as the cardinality. Accessed using the len () function.

Contains (element): Determines if the given value is an element of the set and returns the appropriate Boolean value.

Add (element): Modifies the set by adding the given value or element to the set if the element is not already a member. If the element is not unique no action is taken and the operation is skipped.

Remove (element): Removes the given value from the set if the value is contained in the set and raises an exception otherwise.

IsSubsetOf (setB): Determines if the set is a subset of another set and returns a Boolean value. For set A to be a Boolean value. For set A to be a subset of B , all elements in A must also be elements in B.

Union (set B): Creates and returns a new set that is the union of this set and set B. The new set created from the union of two sets. A and B, contains all elements in A plus those elements in B that are not in A Neither set A nor set B is modified by this operation.

Intersect (setB): Creates and returns a new set that is the intersection of this set and setB . the intersection of sets A and B contains only those elements that are in both A and B. Neither set A nor set B is modified by this operation**.**

Difference (set B): Creates and returns a new set that is the difference of this and setB. The set difference, A-B, contains only those elements that are in A but not in B. Neither set A nor set B is modified by this operation**.**

Iterator (): Creates and returns an iterator that can be used to iterator over the collection of itesm.

Algorithm: Write your own algorithm.

Program: Write your own program and attach printouts

Output:

Conclusion:

We have studied in depth, the concept of ADT, function of sets, the implementation of set functions and working of set function.

Questions:

1. **Explain set with example.**
2. **What is ADT?**
3. **Explain basic functions of set {Add, Remove, contains & size}**
4. **Write algorithm with suitable example**
   a) Intersection of two set
   b) Union of two set
   c) Difference between two set
   d) Subset