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Assignment 9

- Title:- Set Operations
- Problem Statement

To create ADT that implements the set concept.

1) Add
2) Remove
3) Contains
4) Size ()
5) Iterator ()
6) Unions
7) Intersection
8) Difference
9) Subsets

- Objective:

1) To learn set operations using array or linked list.

- Outcome:

I will be able to implement set using array and perform various operations on it.

- Requirements:

1) 64 bit operating system.
2) Editor, Compiler (g++)
3) CPU, RAM, etc.

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* Theory:

Set

In mathematics, a set is a collection of distinct objects, considered as an object in it's own right. Each element in the universe is either inside or outside the set. Therefore Set is a well-defined collection of objects.

Operations:

Union, Intersection, Difference, Symmetric Difference are common operations performance on sets.

- Algorithm:

- Union (A, B)

1) Put all elements of set A in union C
2) Traverse set B & put those elements in union which are not present in A.

- Intersection (A, B)

1. Select a element from set A.
2. Check if it is present in B
   2. If yes put it in set intersection
3. Repeat steps 1 & 2 until all elements are traversed.

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* Test Cases:

	Input	Operation	Output	Expected
1)	A = {1, 3, 5, 7, 9, 11, 13}	A ∩ B	{1, 3, 5, 7, 9}	Success
	B = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}	A ∪ B	{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13}	Yes
		A - B	{11, 13}	Yes
		B - A	{2, 4, 6, 8, 10}	Yes
		A ⊄ B		Yes
		B ⊄ A		Yes
		Size(A)	7	Yes
		Size(B)	10	Yes

* Conclusion:

ADT set has been implemented successfully.