Exp1 : Insertion and Deletion in an array

Aim: Write a program to insert an element and delete an element in an Array.

Theory:

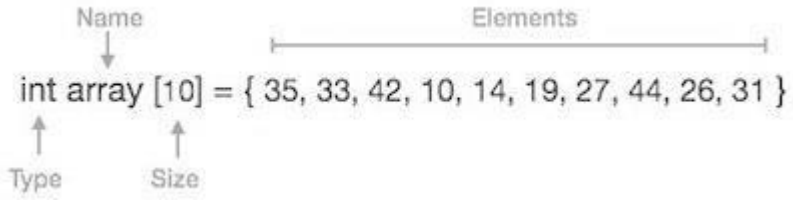
- Array is a container which can hold a fix number of items and these itemsshould be of the same type.
- Most of the data structures make use of arrays to implement their algorithms. Following are the important terms to understand the concept of Array.

Element − Each item stored in an array is called an element.

Index − Each location of an element in an array has a numerical index, which isused to identify the element.

Array Representation

Arrays can be declared in various ways in different languages. For illustration,let's take C array declaration.



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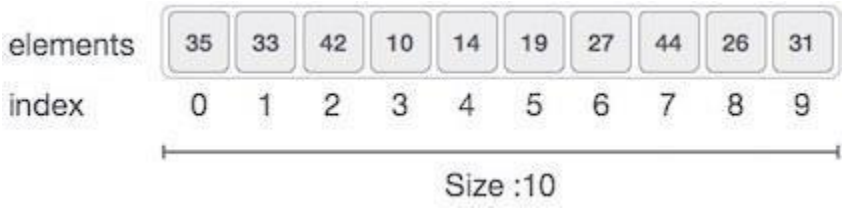

Following are the important points to be considered. Index starts with 0.

Array length is 10 which means it can store 10 elements.Each element can be accessed via its index.

Basic Operations

Following are the basic operations supported by an array.

Traverse − print all the array elements one by one.

Insertion − Adds an element at the given index.

Deletion − Deletes an element at the given index.

Search − Searches an element using the given index or by the value.Update −

Updates an element at the given index.

Procedure:

Insertion Operation

Insert operation is to insert one or more data elements into an array. Based on the requirement, a new element can be added at the beginning, end, or any givenindex of array.

Algorithm: Inserting new element in an array

The algorithm INSERT will be declared as INSERT(LA, N, K, ITEM).

LA is a linear array with N elements and K is a positive integer such that K<=N.This algorithm inserts an element ITEM into the Kth position in LA.

```
Step 1: [INITIALIZATION] SET J = N
Step 2: Repeat Steps 3 and 4 while J >= K
Step 3: [Move jth element downword] SET AL[J + 1] = AL[J]
Step 4: [Decrease Counter]    SET J = J - 1
     [End of step 2 loop]
Step 5: [Insert Element] SET LA[K]:= Item
Step 6: SET N = N + 1
Step 7: EXIT
```

Program:

OUTPUT:

Algorithm: Deleting an element from an array

The algorithm DELETE will be declared as DELETE (LA, N, K,ITEM).

DELETE(LA,N,K,ITEM)
Here LA is a linear array with N elements and K is a positive integer such that k<=N. this algorithm deletes the kth element from LA

```
Step 1: Set ITEM:=LA[k]
Step 2: Reapeat for J=K to N-1:
    [Move J+1st element upward.] SET LA[J]:= LA[J+1].
    [End of loop]
Step 3: [Reset the number N of elements in LA.] SET N:=N-1
Step 4: EXIT
```

Program:

Output:

Conclusion