



Lab#02-Arrays

Objective

To understand the implementation of Array, inserting an element in Array, deleting or updating an element in Array, traversing an Array and searching an element in Array.

Theory

Array

An array is a collection of elements of same data type of fixed length. The length of an array is created when the array is created. The elements of an array are accessed with the help of sequential numbers which are called indexed numbers. The starting index no of an array is 0. The last index of an array is equal to the length of an array -1.

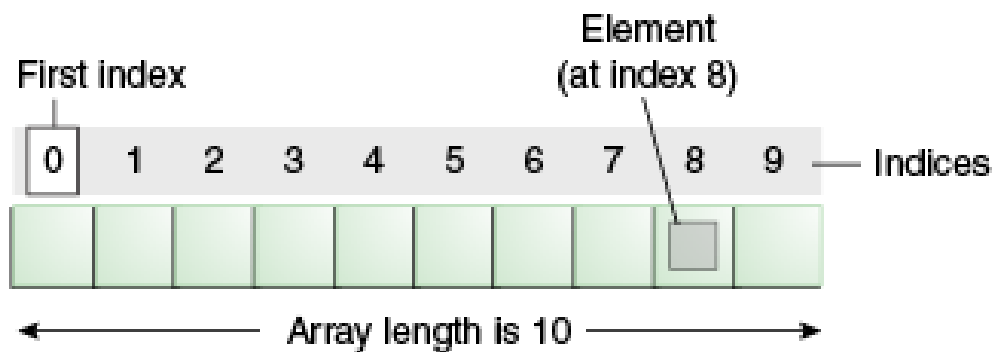


Figure 1 Arrays

Examples

Implementation

```
public class Test {  
    public static void main(String[] args) {  
        int ar [] = {11,20,33,15,12};  
        System.out.println("Elements of array are : " + Arrays.toString(ar));  
    }  
}
```

Insertion

```
public class Test {
```



```
public static void main(String[] args) {  
    int ar [] = new int[5];  
    ar[0]=20;  
    ar[3]=300;  
    ar[1]=140;  
    System.out.println("Elements of array are : " + Arrays.toString(ar));  
}  
}
```

Deletion or update

```
public class Test {  
    public static void main(String[] args) {  
        int ar [] = {11,20,33,15,12};  
        ar[1]=300;  
        ar[3]=0;  
        System.out.println("Elements of array are : " + Arrays.toString(ar));  
    }  
}
```

Searching

```
public class Test {  
    public static void main(String[] args) {  
        int ar [] = {11,20,33,15,12};  
        int n=33;  
        for (int i = 0; i<ar.length; i++){  
            if (ar[i]==n){  
                System.out.println("Found");  
                break;  
            }  
        }  
    }  
}
```



```
    }  
    }  
}
```

Traversing

```
public class Test {  
    public static void main(String[] args) {  
        int ar [] = {11,20,33,15,12};  
        System.out.print("Elements of array are : ");  
        for (int i = 0; i<ar.length; i++){  
            System.out.print(ar[i] + " ");  
        }  
    }  
}
```

Debugging Tasks

```
public class Test (  
    public static void main(String[] args) {  
        int ar1 [] = [11,20,"33",15,12];  
        char ar2 [] = ['a','t','c','g','n'];  
        system.out.println("No of elements in array ");  
        for (i = 1; i>=ar.length; i++){  
            System.out.print ("i");  
        }  
        system.out.println("Elements in integer array ");  
        for (k = 1, k==ar_length; k++){  
            System.out.print (ar[1]);  
        }  
        system.out.println("Elements in character array ")
```



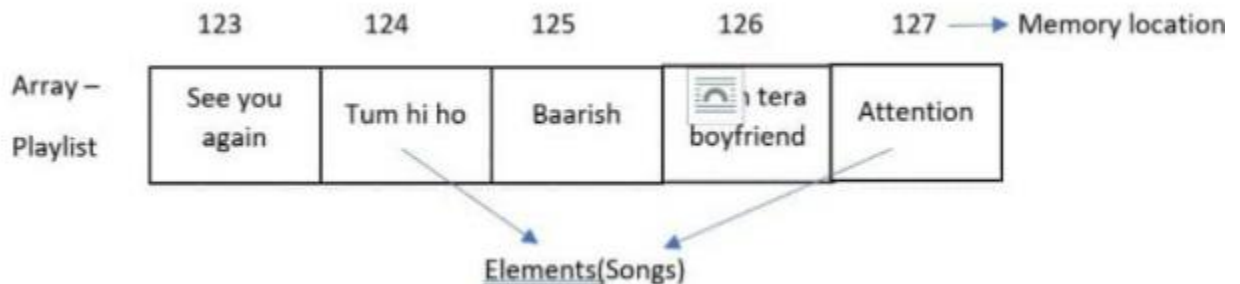
```
        for (j == 0; j=ar2.length; j++){  
            System.out.print (ar2[j]);  
        }  
    }  
}
```

Array application In Real Life

Array in phone

Now, we wish to save a contact number on our phone. The contact app on our phone contains a lot of contacts. They are stored in the form of an array. When we add or delete a contact in our phone, this is similar to adding or deleting elements in an array.

Some applications of arrays in phone-based is the music playlist we create. Here playlist is an array and the songs are elements. Let's picture how this would look like. The below image is just a perception and not an accurate one.



Playlist depicted as array

The phone contacts on our phone would also look in a similar manner. We order products online. We add the products we wish to buy to the cart. The server stores the ordered products in the form of an array. These two examples are simple which is the application of array in real life.

Practice Tasks

Write a program to find the sum of all elements of an integer array having 10 elements.

Output :

Elements of array: 11 , 20 , 33 , 15 , 12 , 44 , 34 , 3 , 24 , 46



Sum of elements: 242

Write a program to find the maximum and minimum value of elements of an integer array having 10 elements.

Output :

Elements of array : 31 , -2 , 73 , 215 , 243 , 14 , 5 , 23 , 2 , 156

Maximum :243

Minimum :-2

Exercise

Task#01: The contact app on our phone contains a lot of contacts. In **ContactApp(class)** perform the following operations:

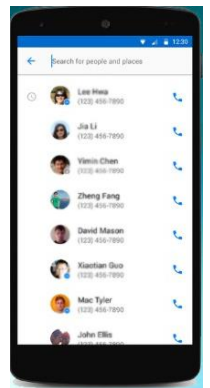
Display all contact

Search a contact //name -> number

Add a new contact // name, number , pos/index

Update the contact //name1, name2

Delete any contact //



NOTE: Create a 2D array of string type.

Task#02: The Music app name is **FireAir(class)** music app which can perform following functions

print all the array songs/music names one by one.

Adds new songs/music.

Deletes a song/music using the number.

Searches song/music using a number or by the name.

Update song/music (index, value)

