Array in Java

Java Array :

Normally, array is a collection of similar type of elements that have contiguous memory location.

Java array is an object the contains elements of similar data type. It is a data structure where we store similar elements. We can store only fixed set of elements in a java array.

Array in java is index based, first element of the array is stored at 0 index.

Array in Java

Advantage of Java Array :

- **Code Optimization: It makes the code optimized, we can retrieve or sort the data easily.**
- **Random access: We can get any data located at any index position.**

Disadvantage of Java Array :

- **Size Limit: We can store only fixed size of elements in the array. It doesn't grow its size at runtime. To solve this problem, collection framework is used in java.**

Array in Java

Single Dimensional Array in java :

Syntax to Declare an Array in java :

```
dataType[] arr; (or)
dataType []arr; (or)
dataType arr[];
```

Instantiation of an Array in java :

```
arr=new datatype[size];
```

Array in Java

Example of single dimensional java array :

```
class Testarray{
public static void main(String args[]){

int a[]=new int[5];//declaration and instantiation
a[0]=10;//initialization
a[1]=20;
a[2]=70;
a[3]=40;
a[4]=50;
for(int i=0;i<a.length;i++)
System.out.println(a[i]);
  }}
```

Array in Java

Example of single dimensional java array :

```
class Testarray1{
public static void main(String args[]){

int a[]={33,3,4,5};//declaration, instantiation and initialization

for(int i=0;i<a.length;i++)
System.out.println(a[i]);

}}
```

Array in Java

Passing Array to method in java :

```
class Testarray{
static void min(int arr[]){
int min=arr[0];
for(int i=1;i<arr.length;i++)
 if(min>arr[i])
  min=arr[i];
System.out.println(min);
}
public static void main(String args[]){
int a[]={33,3,4,5};
min(a);//passing array to method
}}
```

Array in Java

Passing Array to method in java :

```
class Testarray{
static void min(int arr[]){
int min=arr[0];
for(int i=1;i<arr.length;i++)
 if(min>arr[i])
  min=arr[i];
System.out.println(min);
}
public static void main(String args[]){
int a[]={33,3,4,5};
min(a);//passing array to method
}}
```

Array in Java

Two Dimensional Array in java :

Syntax to Declare a 2DArray in java :

```
dataType[][] arr; (or)
dataType [][]arr; (or)
dataType arr[][]; (or)
dataType []arr[];
```

Instantiation of an Array in java :

```
int[][] arr=new int[3][3];
```

Array in Java

Example of Two dimensional java array :

```
class Testarray{
public static void main(String args[]){
//declaring and initializing 2D array
int arr[][]={{1,2,3},{2,4,5},{4,4,5}};

for(int i=0;i<3;i++){
 for(int j=0;j<3;j++){
   System.out.print(arr[i][j]+" ");
 }
 System.out.println();
}
}}
```

Array in Java

What is the class name of java array ?

In java, array is an object. For array object, an proxy class is created whose name can be obtained by getClass().getName() method on the object.

```
class Testarray{
public static void main(String args[]){
int arr[]={4,4,5};
Class c=arr.getClass();
String name=c.getName();
System.out.println(name);
  }}
```

Output : I

Array in Java

Copying a java array :

```
class TestArrayCopyDemo {
    public static void main(String[] args) {
        char[] copyFrom = { 'd', 'e', 'c', 'a', 'f', 'f', 'e',
                'i', 'n', 'a', 't', 'e', 'd' };
        char[] copyTo = new char[7];

        System.arraycopy(copyFrom, 2, copyTo, 0, 7);
        System.out.println(new String(copyTo));
    }
}
```

Output:caffein

Array in Java

Copying a java array :

Syntax of arraycopy method :

```
public static void arraycopy(
Object src, int srcPos,Object dest, int destPos, int length  )
```

Array in Java

Arrays of Objects :

```
class Student
{
    public int roll_no;
    public String name;
    Student(int roll_no, String name)
    {
        this.roll_no = roll_no;
        this.name = name;
    }
}
```

Array in Java

Arrays of Objects :

```
public class GFG
{
    public static void main (String[] args)
    {
        // declares an Array of integers.
        Student[] arr;

        // allocating memory for 5 objects of type Student.
        arr = new Student[5];
```

Array in Java

Arrays of Objects :

```
// initialize the first elements of the array
        arr[0] = new Student(1,"aman");
        arr[1] = new Student(2,"vaibhav");
        arr[2] = new Student(3,"shikar");
        arr[3] = new Student(4,"dharmesh");
        arr[4] = new Student(5,"mohit");

        // accessing the elements of the specified array
        for (int i = 0; i < arr.length; i++)
            System.out.println("Element at " + i + " : " +
                        arr[i].roll_no +" "+ arr[i].name);
    }
}
```