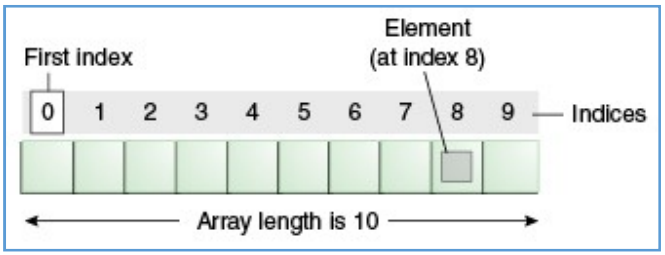
WEEK7

What is an Array?

- An array in Java is like a **box** that holds multiple values of the **same type**. Instead of creating separate variables for each value, we can store all values in one array. The values of an array are stored in a contiguous memory location.
- Java array can also be used as a static field, a local variable, or a method parameter.
- The size of an array must be specified by int or short value and not long.
- An array can contain primitives (int, char, etc.) and object (or non-primitive)
- The values in the array are ordered, and each has an index beginning from 0.



Declaring and Creating an Array

There are two steps to using an array:

1. **Declare the array** (Tell Java you need an array)
2. **Create the array** (Allocate space in memory)

Syntax:

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

Example:

```
int numbers[] = new int[5]; // Creates an array that can store 5 integers
```

Anotherway of creating and Initialization of Java Array

Syntax:

```
datatype arrayName[] = {v1, v2, v3,….,vn};
```

Example:

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

Storing and Accessing Array Elements

Each value in an array has a **position number** called an **index** (starting from 0).

Example:

```
int marks[] = {85, 90, 78, 88, 95};

// Access elements using index
System.out.println(marks[0]); // First element → 85
System.out.println(marks[2]); // Third element → 78

// Changing a value
marks[1] = 92; // Change second element from 90 to 92
System.out.println(marks[1]); // Output: 92
```

Instead of printing each value separately, we use a loop.

Example:

```
    int marks[] = {85, 90, 78, 88, 95};

    for (int i = 0; i < marks.length; i++) {
       System.out.println("Mark " + (i + 1) + ": " + marks[i]);
}
```

Output:

```
Mark 1: 85
Mark 2: 90
Mark 3: 78
Mark 4: 88
Mark 5: 95
```

Example:

```
class Array
{
    public static void main(String args[])
    {
        int a[]={33,3,4,5};//declaration, instantiation and initialization
        //printing array
        for(int i=0;i<a.length;i++)//length is the property of array
        {
            System.out.println(a[i]);
        }
    }
}
```

Passing Array to a Method in Java

Example: Write a program to find minimum no in a list of numbers.

```
class Minimum
{
    //creating a method which receives an array as a parameter
    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);
    }
}
```

```
class MinMain
{
	public static void main(String args[])
	{
		int a[]={40, 51, 25, 15, 100, 50, 10,,212};
		Minimum M = new Minimum();
		M.min(a);//passing array to method
	}
}
```

Returning Array from the Method

Example:

```
//Java Program to return an array from the method
class ReturnArray
{
	//creating method which returns an array
	public int[] get()
	{
		int a[] = {10,30,50,90,60};
		return (a);
	}

class ReturnArrayMain
{
	public static void main(String args[])
	{
		ReturnArray R = new ReturnArray();
		//calling method which returns an array
		int arr[] = get();
		//printing the values of an array
		for(int i=0; i < arr.length;i++)
			System.out.println(arr[i]);
	}
}
```