

## 1D and 2D Arrays and ArrayLists

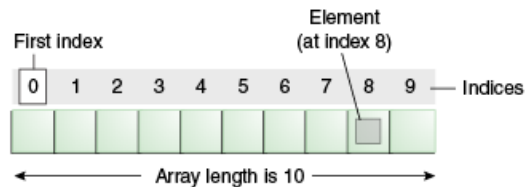
### Sources

<http://docs.oracle.com/javase/tutorial/figures/java/objects-tenElementArray.gif>

[http://en.wikipedia.org/wiki/Array\\_data\\_structure](http://en.wikipedia.org/wiki/Array_data_structure)

### Summary

Arrays are a type of data structure with a specified size in which each spot holds a value of the same type. The length of an array cannot be changed and is decided upon when the object is made. Each spot in an array holds an item called an *element* which can be accessed by its *index*, or the number that represents its position in the array. The index begins at zero, so the highest index in an array of size ten would only be 9. As you can see in the picture, the 9<sup>th</sup> element would be at index 8.

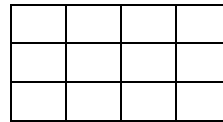


Arrays can be created in 1D or 2D. 1D arrays are just one row of values, while 2D arrays contain a grid of values that has several rows/columns.

1D:



2D:



An ArrayList is just like a 1D Array except it's length is unbounded and you can add as many elements as you need.

In order to create a 1D or 2D Array you need to specify the type of object that you are going to be storing in the array when you create it. When you create an array you type the name of the object followed by two brackets, which represent the array part of the creation. You declare the size of the array when you actually initialize it.

The only difference when making a 2D array is that you now have two sets of brackets, the first one representing the number of rows you want and the second representing your columns.

Creating an ArrayList is done a little differently. You type out `ArrayList<object type here>()` and you don't need to specify a size .

### Code examples:

```
int[] newArray1D = new int[5]; (Creates a 1D Array of length 5 that holds integers)
```

```
Int[][] newArray2D = new int[5][6]; (Creates a 2D Array with 5 rows and 6 columns that holds integers)
```

```
ArrayList<String> newList = new ArrayList<String>(); (Creates an ArrayList that holds as many Strings as needed)
```

```
newArray1D[0] = 5; (Sets the first value in the Array to 5)
```

```
newArray2D[2][1] = 3; (Sets the value at the 3rd row and 2nd column to 3)
```

```
newList.add("Test"); (Adds the String "Test" to the next available slot in the ArrayList, here being the first spot)
```