Java Arrays

Java array is an object which contains elements of a similar data type. Additionally, The elements of an array are stored in a contiguous memory location. It is a data structure where we store similar elements. We can store only a fixed set of elements in a Java array.

Array in Java is index-based, the first element of the array is stored at the 0th index, 2nd element is stored on 1st index and so on.

Basics of Arrays in Java

There are some basic operations we can start with as mentioned below:

1. Array Declaration

To declare an array in Java, use the following syntax:

type[] arrayName;

- **type**: The data type of the array elements (e.g., int, String).
- **arrayName**: The name of the array.

Note: The array is not yet initialized.

2. Create an Array

To create an array, you need to allocate memory for it using the new keyword:

```
// Creating an array of 5 integers
int[] numbers = new int[5];
```

This statement initializes the numbers array to hold 5 integers. The default value for each element is 0.

3. Access an Element of an Array

We can access array elements using their index, which starts from 0:

```
// Setting the first element of the array
numbers[0] = 10;

// Accessing the first element
int firstElement = numbers[0];
```

The first line sets the value of the first element to 10. The second line retrieves the value of the first element.

4. Change an Array Element

To change an element, assign a new value to a specific index:

```
// Changing the first element to 20
numbers[0] = 20;
```

5. Array Length

We can get the length of an array using the length property:

```
// Getting the length of the array
int length = numbers.length;
```

Advantages

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

Disadvantages

- **Size Limit:** We can store only the 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 which grows automatically.

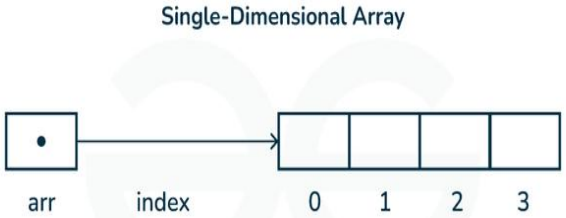
Types of Array in java

There are two types of array.

- Single Dimensional Array
- Multidimensional Array

1. Single-Dimensional Arrays

- These are the most common type of arrays, where elements are stored in a linear order.
- ```
  // A single-dimensional array
  int[ ] singleDimArray = {1, 2, 3, 4, 5};
  ```
  ```



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2. Multi-Dimensional Arrays

- Arrays with more than one dimension, such as two-dimensional arrays (matrices).
- ***// A 2D array (matrix)***
  int[ ][ ] multiDimArray = {
  {1, 2, 3},
  {4, 5, 6},
  {7, 8, 9} };