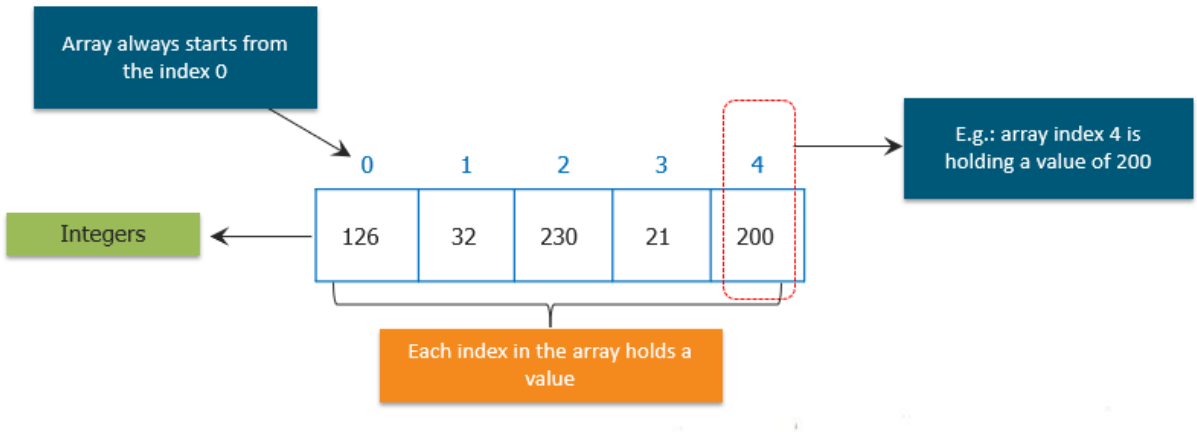
Arrays

What are Java Arrays?

Arrays in Java are homogeneous data structures implemented in Java as objects. Arrays store one or more values of a specific data type and provide indexed access to store the same. A specific element in an array is accessed by its index. Arrays offer a convenient means of grouping related information.

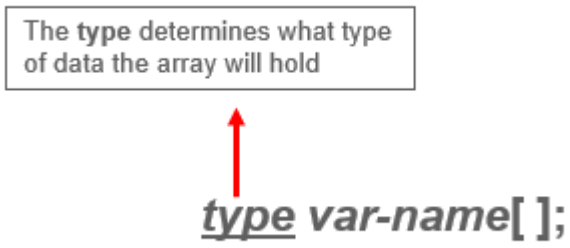


Obtaining an array is a two-step process.

- **First, you must declare a variable of the desired array type**
- **Second, you must allocate the memory that will hold the array, using new, and assign it to the array variable**

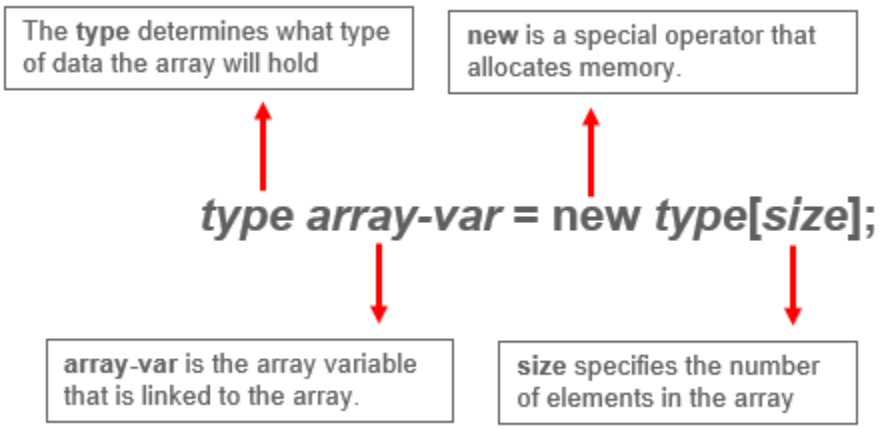
So, let us see how can we declare arrays in different ways.

General Form of Java Array Initialization

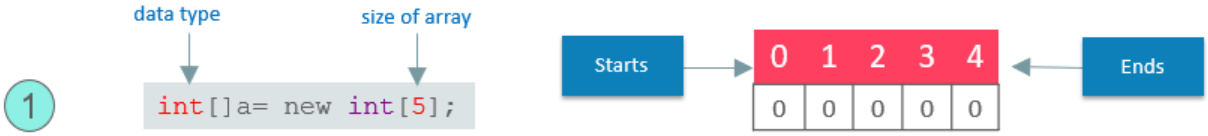


Example*:- int month_days[];*

General Form of Java Array Initialization

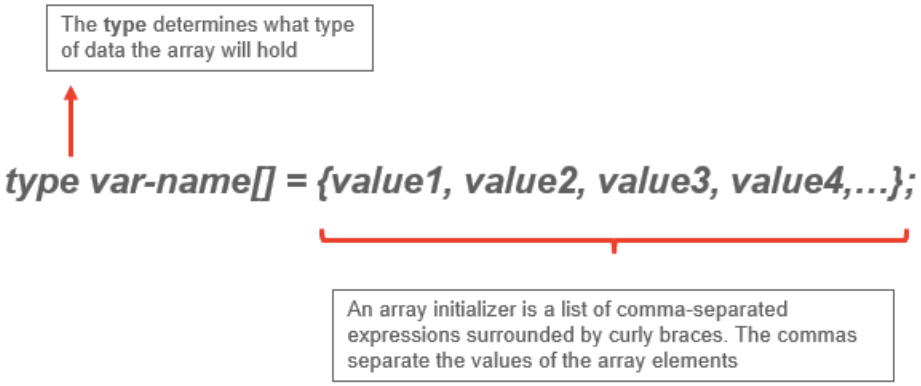


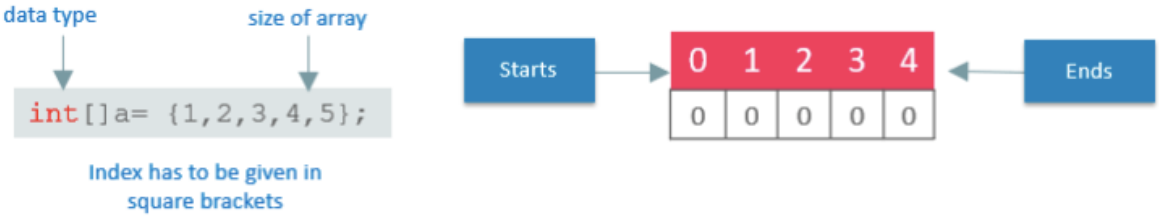
Example:-



Arrays can be initialized when they are declared. The array will automatically be created large enough to hold the number of elements you specify in the array initializer. There is **no** need to use **new**.Now, let us see how we can implement this.

General Form of Java Array Initialization





The following code creates an initialized array of integers:

```
class MyArray{

public static voide main(String args[]){

int month_days[ ] = {31,28,31,30,31,30,31,30,31,30,31};

System.out.println("April has " + month+days[3] + "days.");

}

}
```

It will only be fair if I explain how you can access elements in a Java Array.

The following code creates an initialized array of integers:

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}

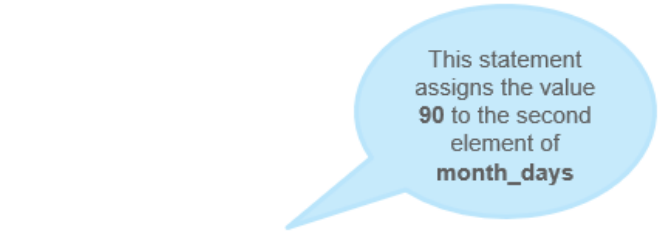
}
```

It will only be fair if I explain how you can access elements in a Java Array.

Accessing a Specific Element in a Java Array

In arrays, we can access the specific element by its index within square brackets.

Example:-




```
month_days[1] = 90;
```

Putting together all the pieces,

```
public static void main(String args[]) {
   int month_days[];
    month_days = new int[12];
    month_days[0] = 31;
    month_days[1] = 28;
    month_days[2] = 31;
    month_days[3] = 30;
    month_days[4] = 31;
    month_days[5] = 30;
    month_days[6] = 31;
    month_days[8] = 30;
    month_days[9] = 31;
    month_days[10] = 30;
    month_days[11] = 31;
     System.out.println("April has " + month_days[3] + " days.");
     }
}
```

So, this was all about the arrays and its declaration and how single dimension arrays can be used.

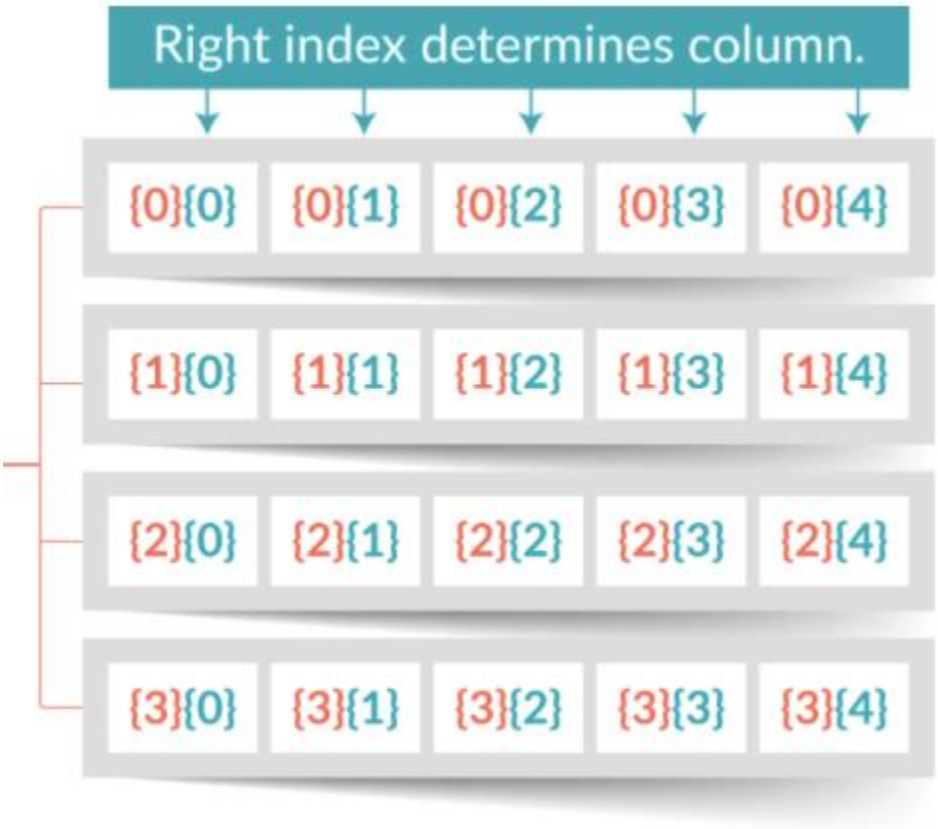
Java Multidimensional Array

Multidimensional arrays are *arrays of arrays.*

Declaring Multidimensional Array

To declare it, we have to specify each additional index using another set of square brackets.

Conceptually, the array declared above would be represented as shown in the figure:-



Let us now Demonstrate Multidimensional Array.

The following program, numbers each element in the array from left to right, top to bottom, and then displays these values:

```
class Mul2D{
 public static void main(String args[]) {
        int mul2d[][]= new int[4][5];
         int i, j, k = 0;
      for(i=0; i<4; i++)
        for(j=0; j<5; j++) {
        Mul2D[i][j] = k;
        k++;
}
for(i=0; i<4; i++) {
    for(j=0; j<5; j++);
        System.out.print(mul2d[i][j] + " ");
        System.out.println();
        }
   }
}
```

This program generates the following output:

```
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
```

Passing Java Array to a Method

We can also pass arrays to methods just as we can pass primitive type values to methods.

Example:-

```
public class PMethods{
public static void display(int y[])
      {
            System.out.println(y[0]);
            System.out.println(y[1]);
            System.out.println(y[2]);

      }
public static void main(String args[])
      {
      int x[] = { 1, 2, 3 };
      display(x);
      }
}
```

Example of Multidimensional Java Array

Let's see the simple example to declare, instantiate, initialize and print the 2Dimensional array.

```
1.  //Java Program to illustrate the use of multidimensional array
2.  class Testarray3{
3.  public static void main(String args[]){
4.  //declaring and initializing 2D array
5.  int arr[][]={{1,2,3},{2,4,5},{4,4,5}};
6.  //printing 2D array
7.  for(int i=0;i<3;i++){
8.   for(int j=0;j<3;j++){
9.     System.out.print(arr[i][j]+" ");
10.  }
11.  System.out.println();
12. }
13. }}
```