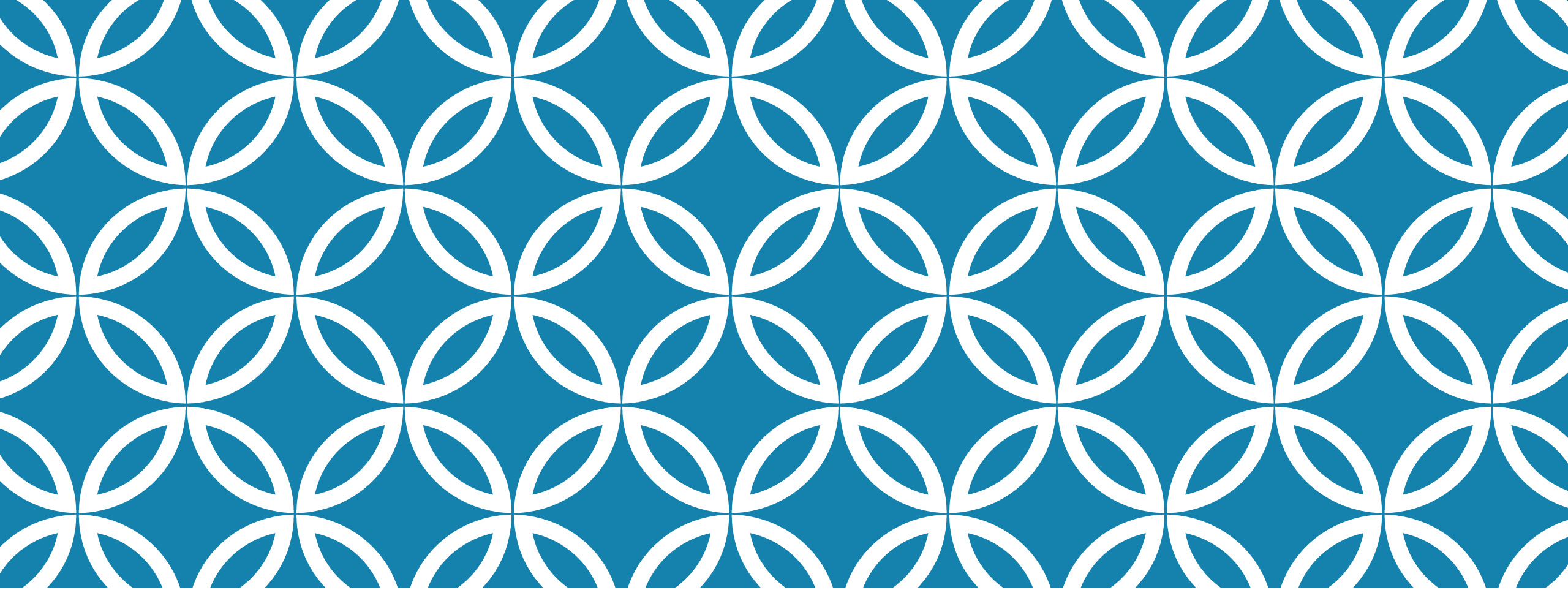


ARRAY IN JAVA

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

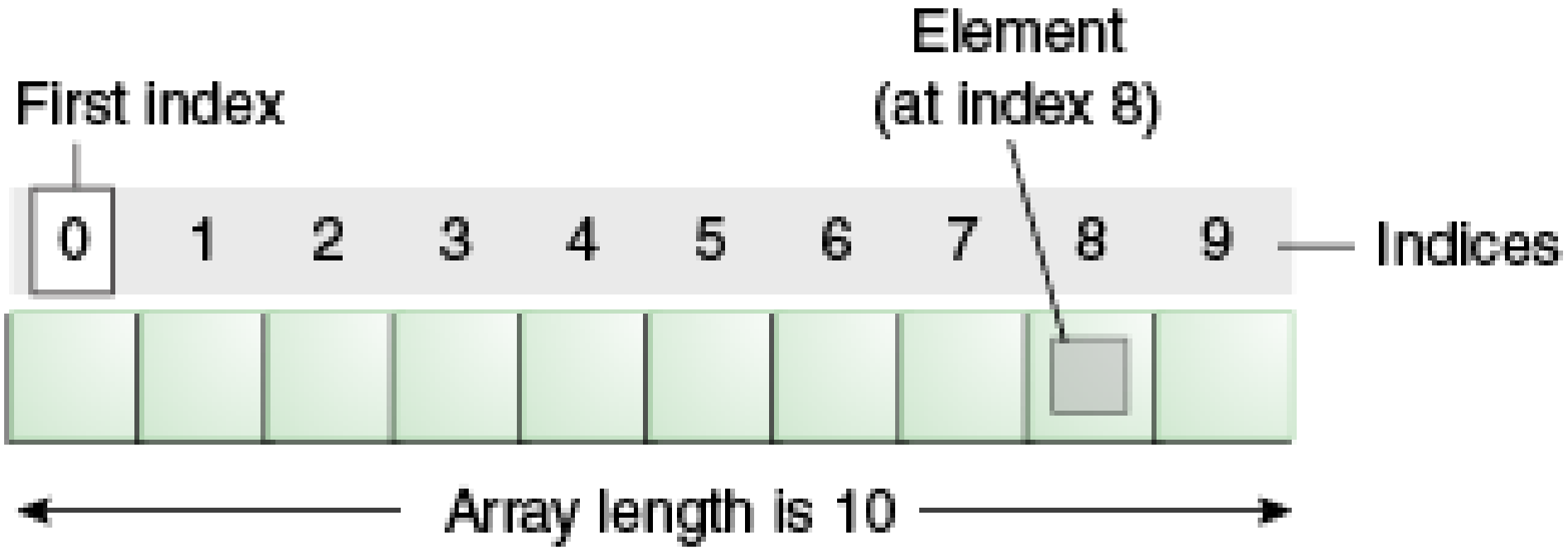
Java array is an object which contains elements of a similar data type. Additionally, The elements of an array are stored in a contiguous memory location. It is a data structure where we store similar elements. We can store only a fixed set of elements in a Java array.

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.

Unlike C/C++, we can get the length of the array using the length member. In C/C++, we need to use the sizeof operator.

In Java, array is an object of a dynamically generated class. Java array inherits the Object class, and implements the Serializable as well as Cloneable interfaces. We can store primitive values or objects in an array in Java. Like C/C++, we can also create single dimensional or multidimensional arrays in Java.

Moreover, Java provides the feature of anonymous arrays which is not available in C/C++.


Element
(at index 8)
First index
0
1
2
3
4
5
6
7
8
9
Indices
Array length is 10

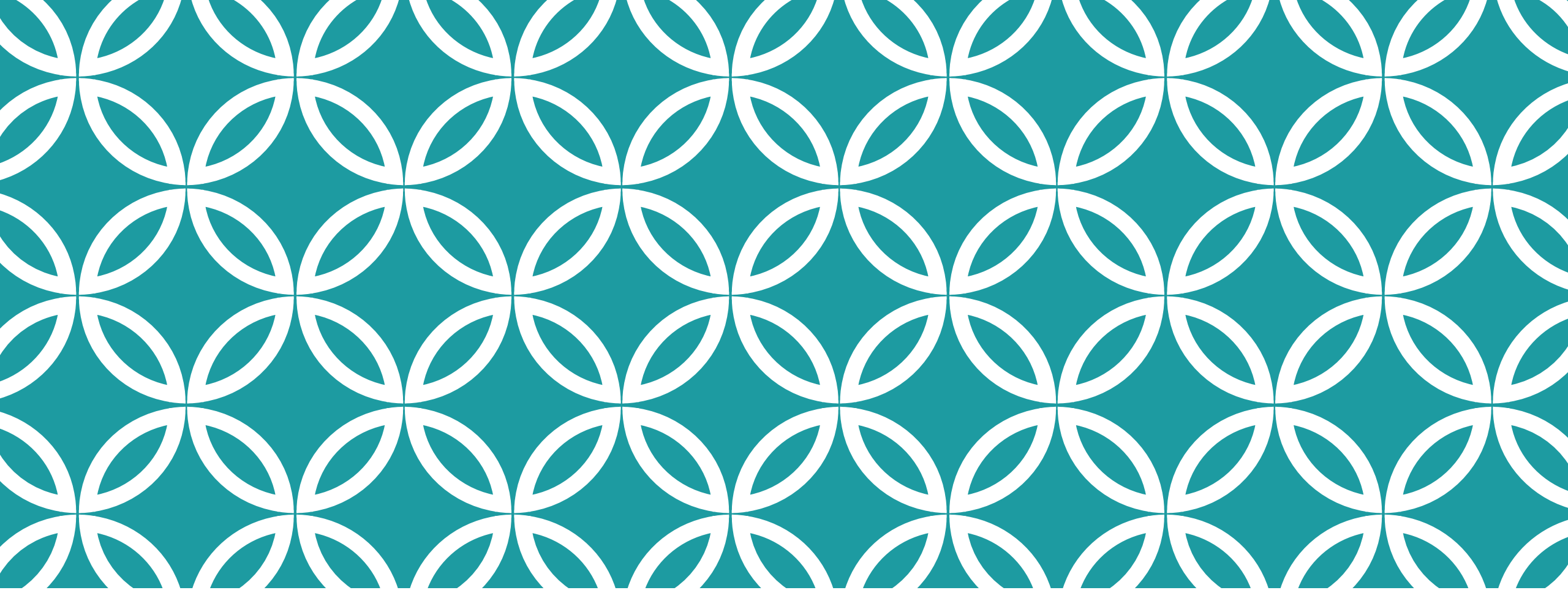
ADVANTAGES

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.

1. Single Dimensional Array
2. Multidimensional Array

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

arrayRefVar=**new** datatype[size];

EXAMPLE OF JAVA ARRAY

Let's see the simple example of java array, where we are going to declare, instantiate, initialize and traverse an array.

```
//Java Program to illustrate how to declare, instantiate, initialize
//and traverse the Java array.
class Testarray{
public static void main(String args[]){
int a[]=new int[5];//declaration and instantiation
a[0]=10;          a[1]=20;          a[2]=70;          a[3]=40;          a[4]=50;
//traversing array
for(int i=0;i<a.length;i++) {      System.out.println(a[i]);
}}
```

DECLARATION, INSTANTIATION AND INITIALIZATION OF JAVA ARRAY

We can declare, instantiate and initialize the java array together by:

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

Let's see the simple example to print this array.

```
//Java Program to illustrate the use of declaration, instantiation
//and initialization of Java array in a single line

class Testarray1{
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]);
}}
```

FOR-EACH LOOP FOR JAVA ARRAY

We can also print the Java array using **for-each loop**. The Java for-each loop prints the array elements one by one. It holds an array element in a variable, then executes the body of the loop.

The syntax of the for-each loop is given below:

```
for(data_type variable:array){

//body of the loop

}
```

Let us see the example of print the elements of Java array using the for-each loop.

```
//Java Program to print the array elements using for-each loop
class Testarray1{
public static void main(String args[]){
int arr[]={33,3,4,5};
//printing array using for-each loop
for(int i:arr)
System.out.println(i);
}}
```

PASSING ARRAY TO A METHOD IN JAVA

We can pass the java array to method so that we can reuse the same logic on any array.

Let's see the simple example to get the minimum number of an array using a method.

```
class Testarray2{
//creating a method which receives an array as a parameter
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};//declaring and initializing an array
        min(a);//passing array to method
}}
```

ANONYMOUS ARRAY IN JAVA

Java supports the feature of an anonymous array, so you don't need to declare the array while passing an array to the method.

```
//Java Program to demonstrate the way of passing an anonymous array
//to method.
public class TestAnonymousArray{
//creating a method which receives an array as a parameter
static void printArray(int arr[]){
for(int i=0;i<arr.length;i++)
System.out.println(arr[i]);
}

public static void main(String args[]){
printArray(new int[]{10,22,44,66});//passing anonymous array to method
}}
```

RETURNING ARRAY FROM THE METHOD

```
class TestReturnArray{

static int[] get(){

return new int[]{10,30,50,90,60};

}

public static void main(String args[]){

        int arr[]=get();

        for(int i=0;i<arr.length;i++)

        System.out.println(arr[i]);

}}
```

MULTIDIMENSIONAL ARRAY IN JAVA

In such case, data is stored in row and column based index (also known as matrix form).

Syntax to Declare Multidimensional Array in Java

dataType[][] arrayRefVar; (or)

dataType [][]arrayRefVar; (or)

dataType arrayRefVar[][]; (or)

dataType []arrayRefVar[];

EXAMPLE OF MULTIDIMENSIONAL JAVA ARRAY

```
class Testarray3{
public static void main(String args[]){
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();
}
}}
```

JAGGED ARRAY IN JAVA

If we are creating odd number of columns in a 2D array, it is known as a jagged array. In other words, it is an array of arrays with different number of columns.

```
class TestJaggedArray{
    public static void main(String[] args){
        int arr[][] = new int[3][];
        arr[0] = new int[3];   arr[1] = new int[4];   arr[2] = new int[2];
        int count = 0;
        for (int i=0; i<arr.length; i++)
            for(int j=0; j<arr[i].length; j++)
                arr[i][j] = count++;
// printing
        for (int i=0; i<arr.length; i++){
            for (int j=0; j<arr[i].length; j++){
                System.out.print(arr[i][j]+" ");
            }
            System.out.println();
        } } }
```

WHAT IS THE CLASS NAME OF JAVA ARRAY?

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

```
//Java Program to get the class name of array in Java

class Testarray4{

public static void main(String args[]){

int arr[]={4,4,5};

Class c=arr.getClass();

String name=c.getName();

System.out.println(name);


}}
```