



SYNTAX
TECHNOLOGIES

JAVA

Class 10

Agenda

2D arrays in Java

2D Array

In Java, multidimensional arrays are actually arrays of arrays. It can have multiple rows and multiple columns (also known as matrix form) unlike single dimensional array, which can have only one full row or one full column.

	0	1	2	3
0	45	10	2	1
1	11	54	45	8
2	14	42	8	10

Syntax:

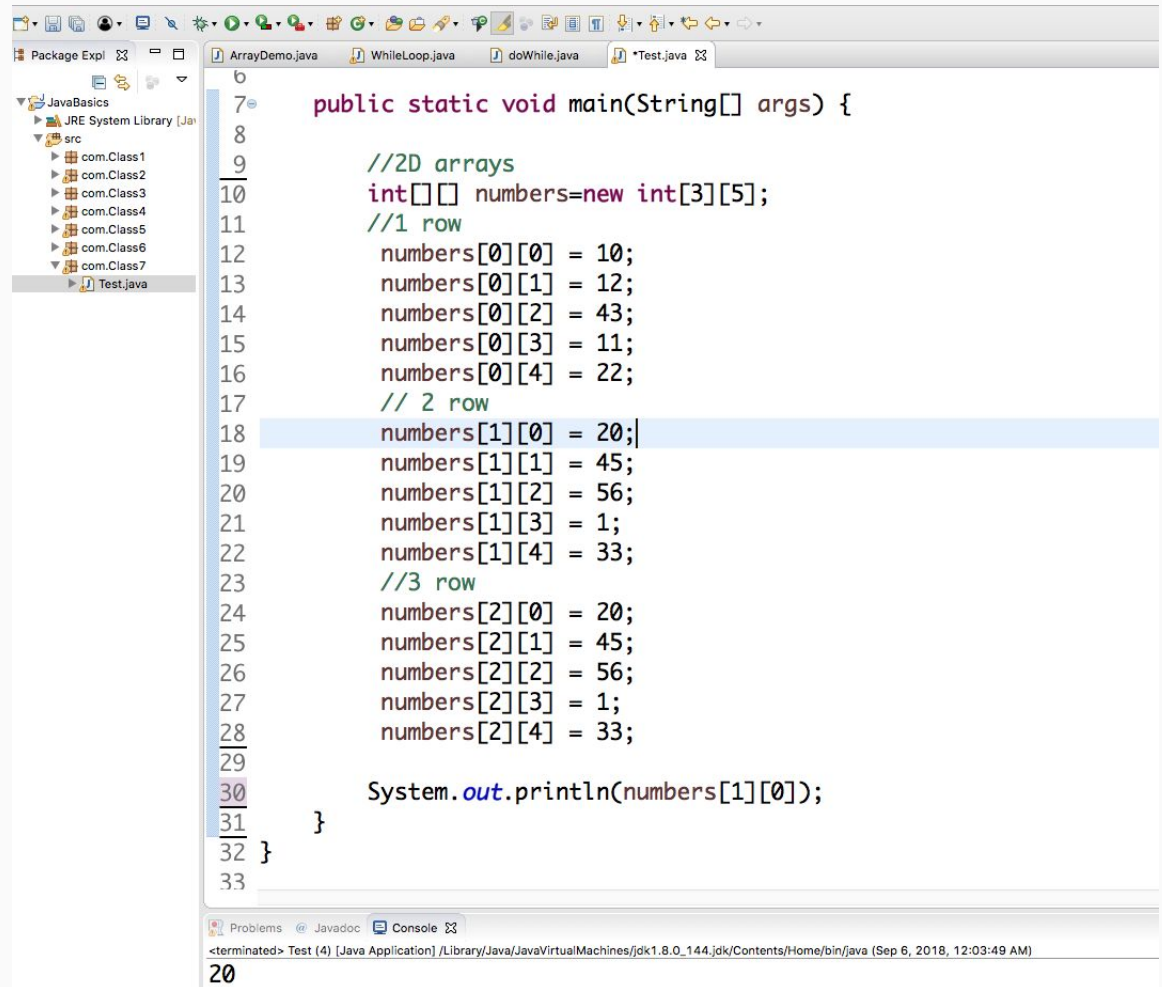
```
Data_Type[][] Array_Name = new int[Row_Size][Column_Size];
```

2D Array

- Each element in the 2D array must be the same type
- Subscripted variables can be use just like a variable:
`rating[0][3] = 10;`
- To access all the items in a multidimensional array the technique is to use one loop inside of another.

	Column 1	Column 2	Column 3	Column 4
Row 1	<code>x[0][0]</code>	<code>x[0][1]</code>	<code>x[0][2]</code>	<code>x[0][3]</code>
Row 2	<code>x[1][0]</code>	<code>x[1][1]</code>	<code>x[1][2]</code>	<code>x[1][3]</code>
Row 3	<code>x[2][0]</code>	<code>x[2][1]</code>	<code>x[2][2]</code>	<code>x[2][3]</code>

2D Array



The screenshot shows an IDE with a project named 'JavaBasics' containing a 'src' folder with several class files. The 'Test.java' file is selected and open in the editor. The code defines a 2D array 'numbers' of type 'int' with dimensions 3x5. It initializes the first row with values 10, 12, 43, 11, and 22. It then initializes the second row with values 20, 45, 56, 1, and 33. The third row is also initialized with values 20, 45, 56, 1, and 33. The program prints the value at 'numbers[1][0]' to the console.

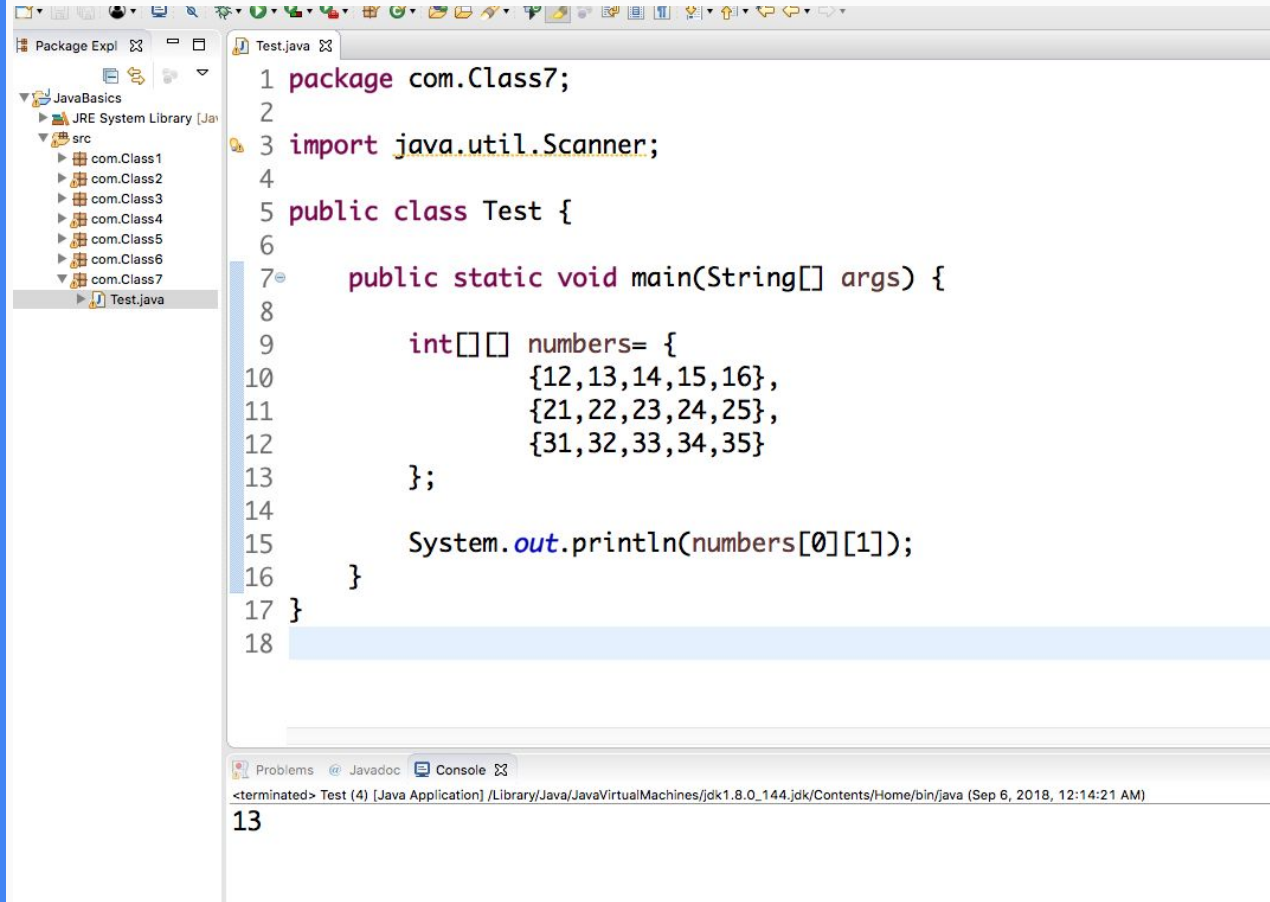
```
7 public static void main(String[] args) {
8
9     //2D arrays
10    int[][] numbers=new int[3][5];
11    //1 row
12    numbers[0][0] = 10;
13    numbers[0][1] = 12;
14    numbers[0][2] = 43;
15    numbers[0][3] = 11;
16    numbers[0][4] = 22;
17    // 2 row
18    numbers[1][0] = 20;
19    numbers[1][1] = 45;
20    numbers[1][2] = 56;
21    numbers[1][3] = 1;
22    numbers[1][4] = 33;
23    //3 row
24    numbers[2][0] = 20;
25    numbers[2][1] = 45;
26    numbers[2][2] = 56;
27    numbers[2][3] = 1;
28    numbers[2][4] = 33;
29
30    System.out.println(numbers[1][0]);
31 }
32 }
33
```

Problems @ Javadoc Console

<terminated> Test (4) [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_144.jdk/Contents/Home/bin/java (Sep 6, 2018, 12:03:49 AM)

20

2D Array



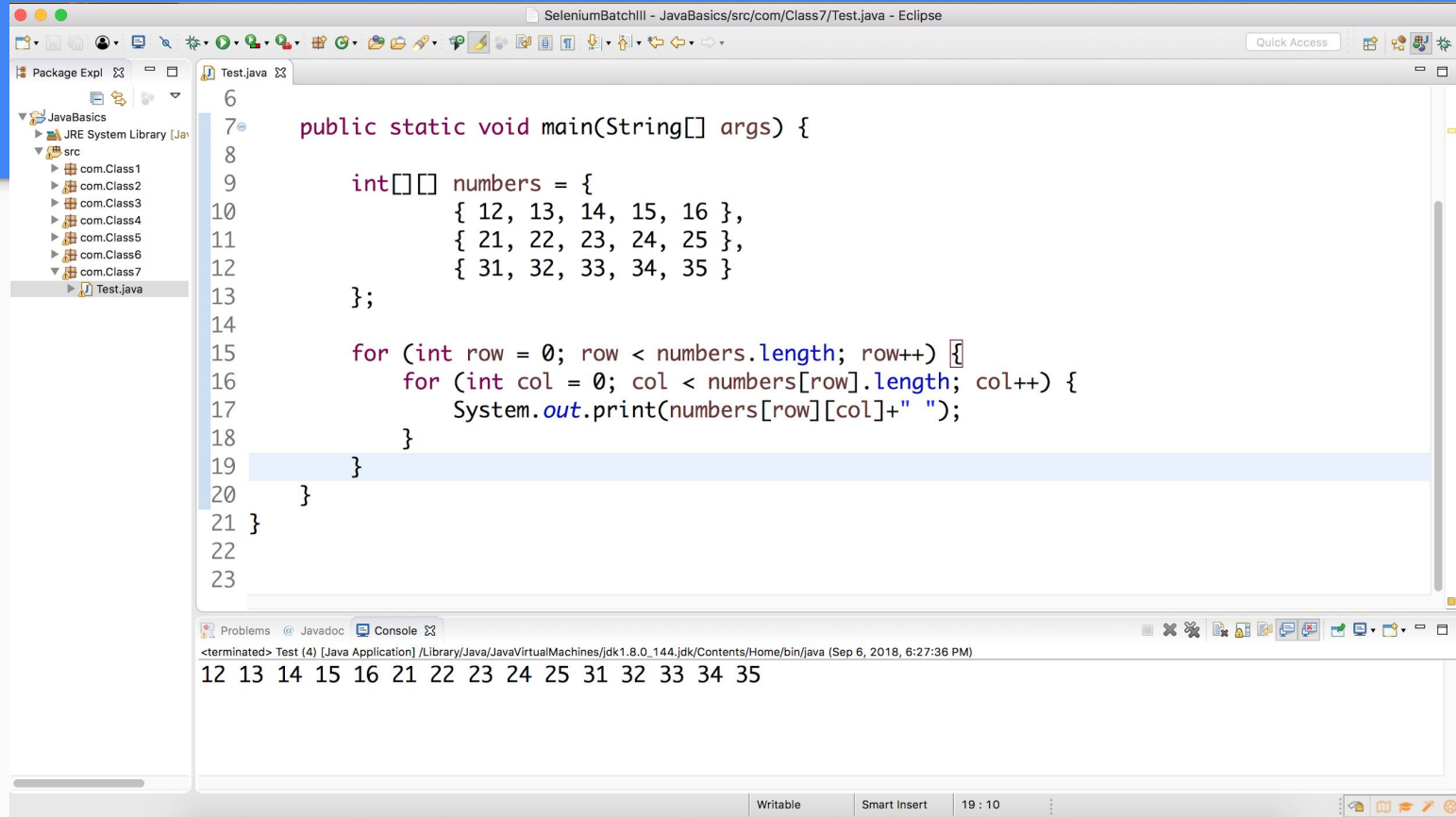
The screenshot shows an IDE with a Package Explorer on the left and a code editor on the right. The Package Explorer shows a project structure with a package 'com' containing classes 'Class1' through 'Class7', and a 'Test.java' file. The code editor displays the following Java code:

```
1 package com.Class7;
2
3 import java.util.Scanner;
4
5 public class Test {
6
7     public static void main(String[] args) {
8
9         int[] numbers= {
10             {12,13,14,15,16},
11             {21,22,23,24,25},
12             {31,32,33,34,35}
13         };
14
15         System.out.println(numbers[0][1]);
16     }
17 }
18
```

At the bottom, the Console window shows the output of the program:

```
<terminated> Test (4) [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_144.jdk/Contents/Home/bin/java (Sep 6, 2018, 12:14:21 AM)
13
```

How print all values from 2D Array



```
6
7 public static void main(String[] args) {
8
9     int[][] numbers = {
10         { 12, 13, 14, 15, 16 },
11         { 21, 22, 23, 24, 25 },
12         { 31, 32, 33, 34, 35 }
13     };
14
15     for (int row = 0; row < numbers.length; row++) {
16         for (int col = 0; col < numbers[row].length; col++) {
17             System.out.print(numbers[row][col]+" ");
18         }
19     }
20 }
21 }
22
23
```

Problems @ Javadoc Console

<terminated> Test (4) [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_144.jdk/Contents/Home/bin/java (Sep 6, 2018, 6:27:36 PM)

12 13 14 15 16 21 22 23 24 25 31 32 33 34 35

Writable Smart Insert 19 : 10