



# **Java Programming**

## **Chapter 5**

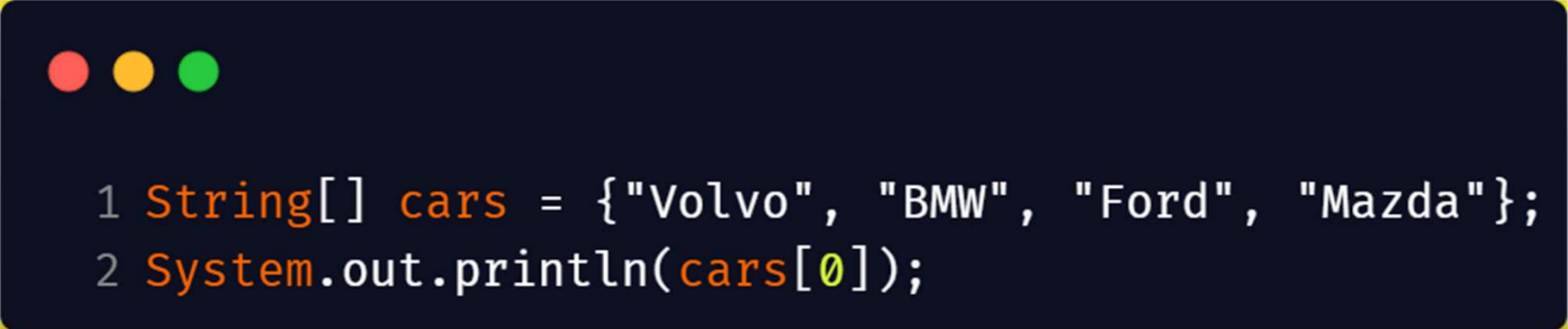
Array

# Arrays

- We use variables to store values.
  - `int number = 1 ;`
  - 2 value
    - `int num1 = 10, num2 = 20;`
  - if 10 values
    - `int num1, num2 ..... num10; ?`
  - if 100 values
    - `=?`

# Arrays

- Arrays are used to store multiple values in a single variable, instead of declaring separate variables for each value.
- To declare an array, define the variable type with square brackets [ ] :
  - `String[] cars = {"Volvo", "BMW", "Ford", "Mazda"};`
- Access the Elements of an Array
  - You can access an array element by referring to the index number.
  - This statement accesses the value of the first element in cars:



```
1 String[] cars = {"Volvo", "BMW", "Ford", "Mazda"};  
2 System.out.println(cars[0]);
```

- Change an Array Element

- cars[0] = "Opel";

- Array Length

- To find out how many elements an array has, use the length property:



```
1 String[] cars = {"Volvo", "BMW", "Ford", "Mazda"};  
2 System.out.println(cars.length);  
3 // Outputs 4
```

- The **new** Keyword

- You can also create an array by specifying its size with new. This makes an empty array with space for a fixed number of elements, which you can fill later:

```
1 String[] cars = new String[4]; // size is 4
2
3 cars[0] = "Volvo";
4 cars[1] = "BMW";
5 cars[2] = "Ford";
6 cars[3] = "Mazda";
7
8 System.out.println(cars[0]); // Outputs Volvo
```

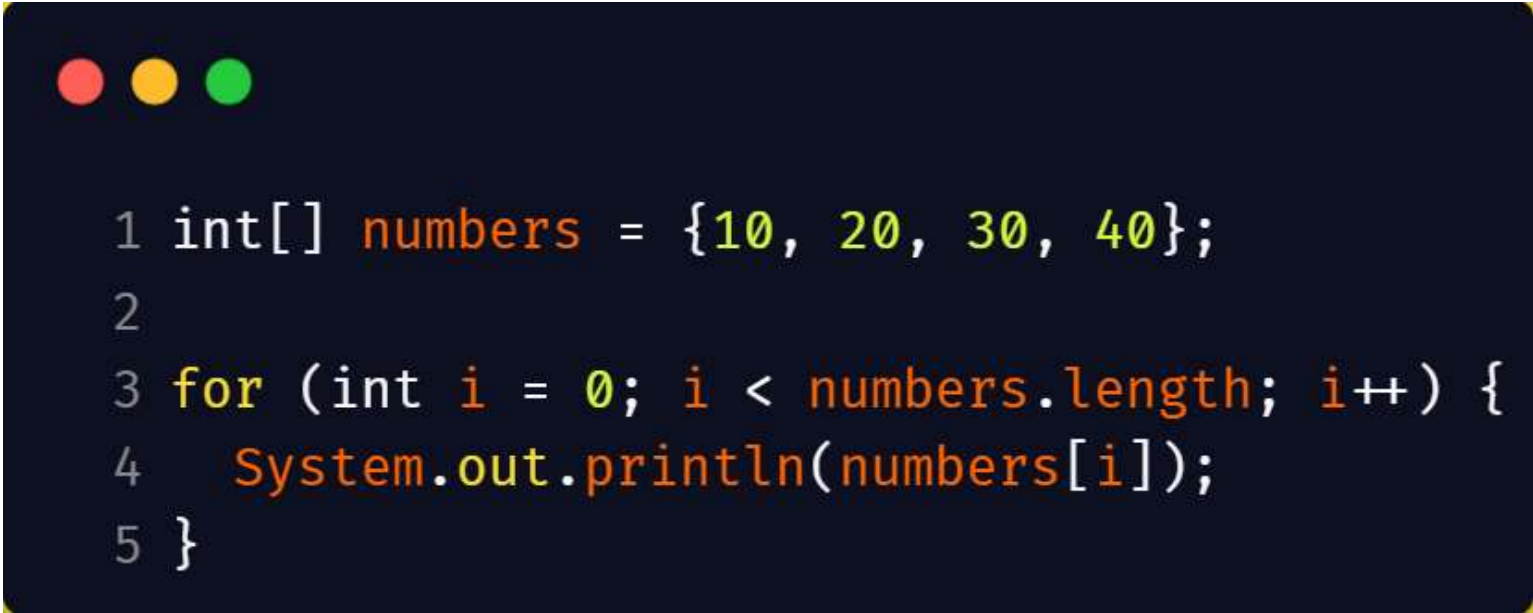
- Loop Through an Array

- You can loop through the array elements with the for loop, and use the length property to specify how many times the loop should run.
- This example creates an array of strings and then uses a for loop to print each element, one by one:



```
1 String[] cars = {"Volvo", "BMW", "Ford", "Mazda"};  
2  
3 for (int i = 0; i < cars.length; i++) {  
4     System.out.println(cars[i]);  
5 }
```

- there is a similar example with numbers. We create an array of integers and use a for loop to print each value:



```
1 int[] numbers = {10, 20, 30, 40};  
2  
3 for (int i = 0; i < numbers.length; i++) {  
4     System.out.println(numbers[i]);  
5 }
```

- let's create a program that calculates the average of different ages:
- code0510.java

```
1 public class Main {
2     public static void main(String[] args) {
3         // An array storing different ages
4         int ages[] = {20, 22, 18, 35, 48, 26, 87, 70};
5
6         float avg, sum = 0;
7
8         // Get the length of the array
9         int length = ages.length;
10
11        // Loop through the elements of the array
12        for (int age : ages) {
13            sum += age;
14        }
15
16        // Calculate the average by dividing the sum by the length
17        avg = sum / length;
18
19        // Print the average
20        System.out.println("The average age is: " + avg);
21    }
22 }
23
```



- we create a program that finds the lowest age among different ages:

```
1 public class Main {
2     public static void main(String[] args) {
3         // An array storing different ages
4         int ages[] = {20, 22, 18, 35, 48, 26, 87, 70};
5
6         // Get the length of the array
7         int length = ages.length;
8
9         // Create a 'lowest age' variable and assign the first array element of ages to it
10        int lowestAge = ages[0];
11
12        // Loop through the elements of the ages array to find the lowest age
13        for (int age : ages) {
14            // Check if the current age is smaller than the current 'lowest age'
15            if (lowestAge > age) {
16                // If the smaller age is found, update 'lowest age' with that element
17                lowestAge = age;
18            }
19        }
20
21        // Output the value of the lowest age
22        System.out.println("The lowest age in the array is: " + lowestAge);
23    }
24 }
```