

# toString() in Java

## Short note on toString()

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Produced      Dr. Siobhán Drohan  
by:            Ms. Mairead Meagher  
                Ms. Siobhan Roche

# Why toString()

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- What if we wish to print out the contents of an object?
- We could just use getters wherever we need to access the values?
- We have a better way...
- toString()

# toString()

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- We will start to write a toString() method for each class.
  - It will be public
  - It can be basic or complicated
- Then other classes can get a 'string' version of the object at any time.
- This is useful if we wish to
  - Examine an object's value
  - Print out an object for reporting purposes.

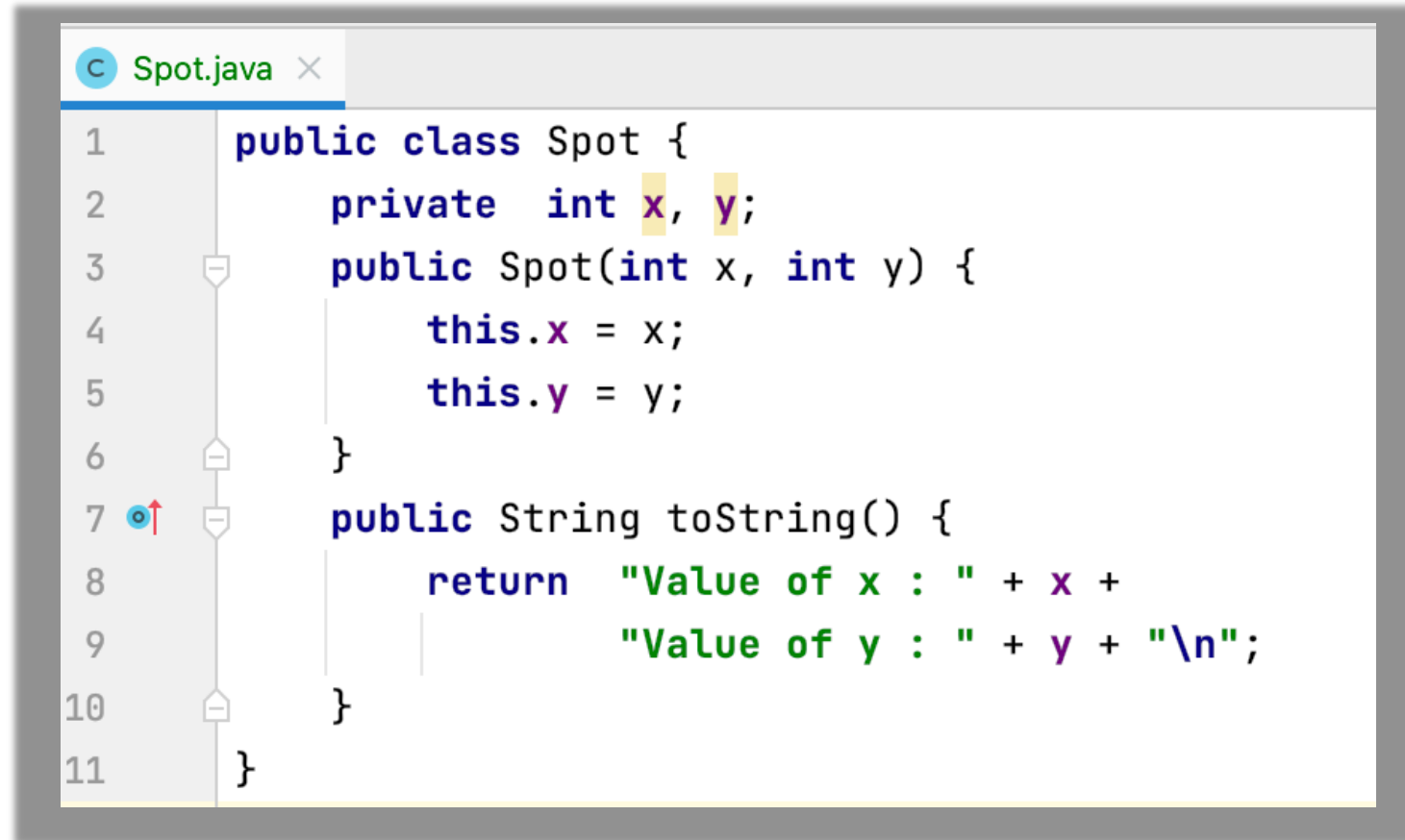
# toString()

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- We will firstly write a toString() for a simple class (Spot)
- Then we will develop a class (Spots) whose main function is to have an array of Spot.
  - We will write a toString() for this collection
  - This toString() uses the Spot toString()..

# Ex 1. Example of toString() in Spot

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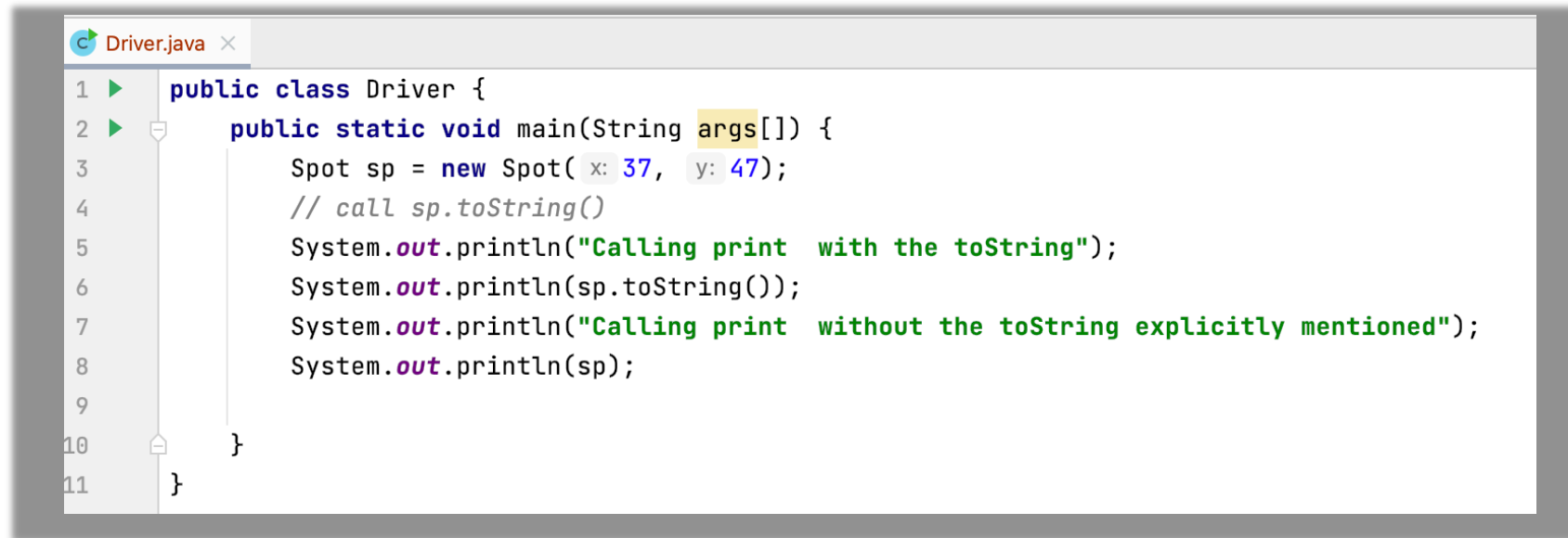
A screenshot of a Java IDE window titled "Spot.java". The code defines a public class Spot with two private integer fields, x and y. It includes a constructor Spot(int x, int y) that initializes these fields. A toString() method is also present, which returns a string formatted as "Value of x : " followed by the value of x, then "Value of y : " followed by the value of y, and a newline character. The code is color-coded: keywords are blue, variables are purple, and string literals are green. A red arrow points to the start of the toString() method on line 7.

```
1 public class Spot {  
2     private int x, y;  
3     public Spot(int x, int y) {  
4         this.x = x;  
5         this.y = y;  
6     }  
7     public String toString() {  
8         return "Value of x : " + x +  
9             "Value of y : " + y + "\n";  
10    }  
11 }
```

Simple Spot Class – Note the toString()

# Ex 1. Using toString()

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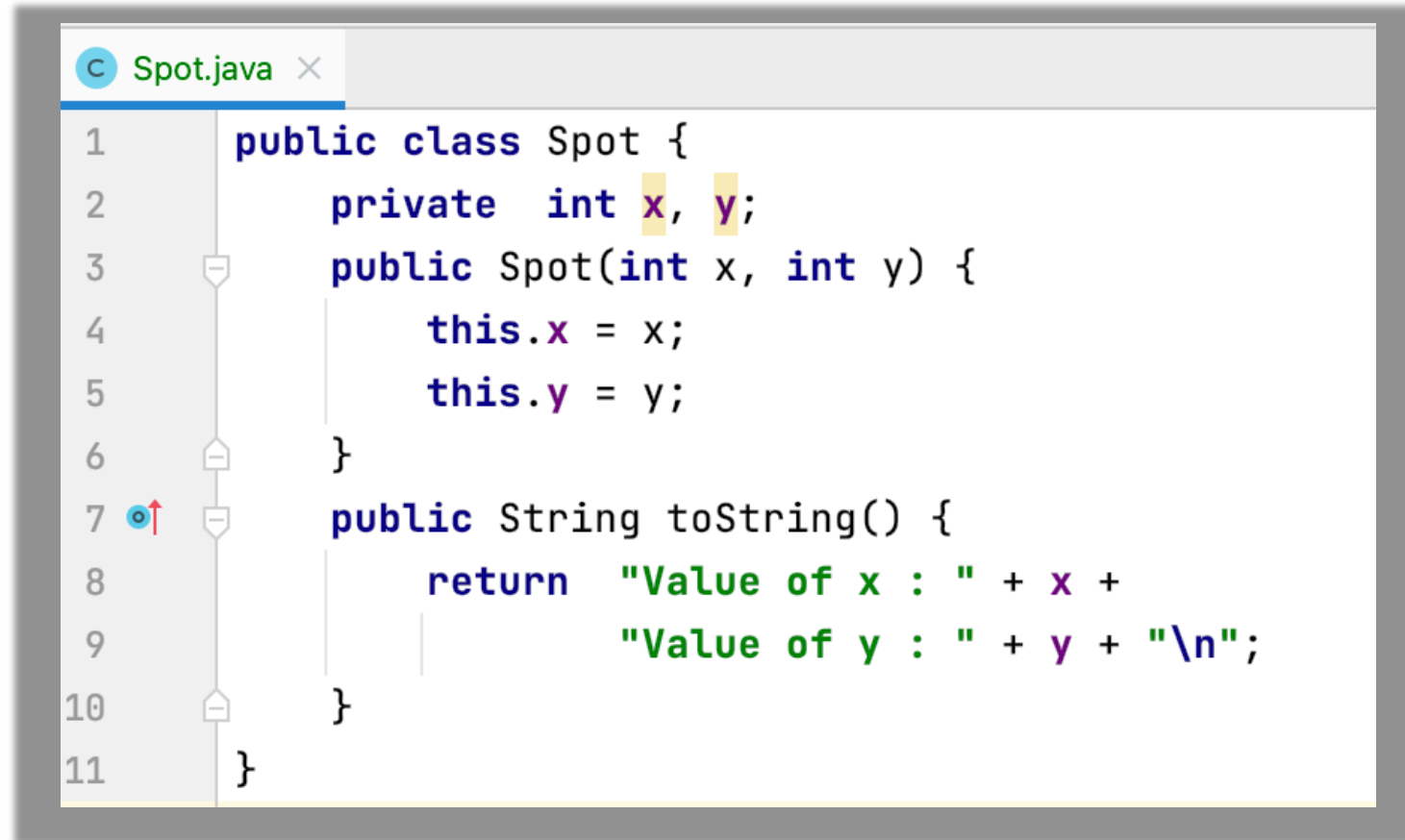


```
Driver.java x
1  ▶ public class Driver {
2  ▶  ▶ public static void main(String args[]) {
3      Spot sp = new Spot( x: 37, y: 47);
4      // call sp.toString()
5      System.out.println("Calling print with the toString");
6      System.out.println(sp.toString());
7      System.out.println("Calling print without the toString explicitly mentioned");
8      System.out.println(sp);
9
10     }
11 }
```

Driver Class using toString()

## Ex 2. Example of toString() for a collection of Spots

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A screenshot of a Java IDE window titled "Spot.java". The code defines a public class Spot with two private integer fields, x and y. It includes a constructor that initializes these fields and a toString() method that returns a string representation of the object. The toString() method is highlighted with a blue cursor on line 7. The code is as follows:

```
1 public class Spot {  
2     private int x, y;  
3     public Spot(int x, int y) {  
4         this.x = x;  
5         this.y = y;  
6     }  
7     public String toString() {  
8         return "Value of x : " + x +  
9             "Value of y : " + y + "\n";  
10    }  
11 }
```

Simple Spot Class – Note the toString() (no change)

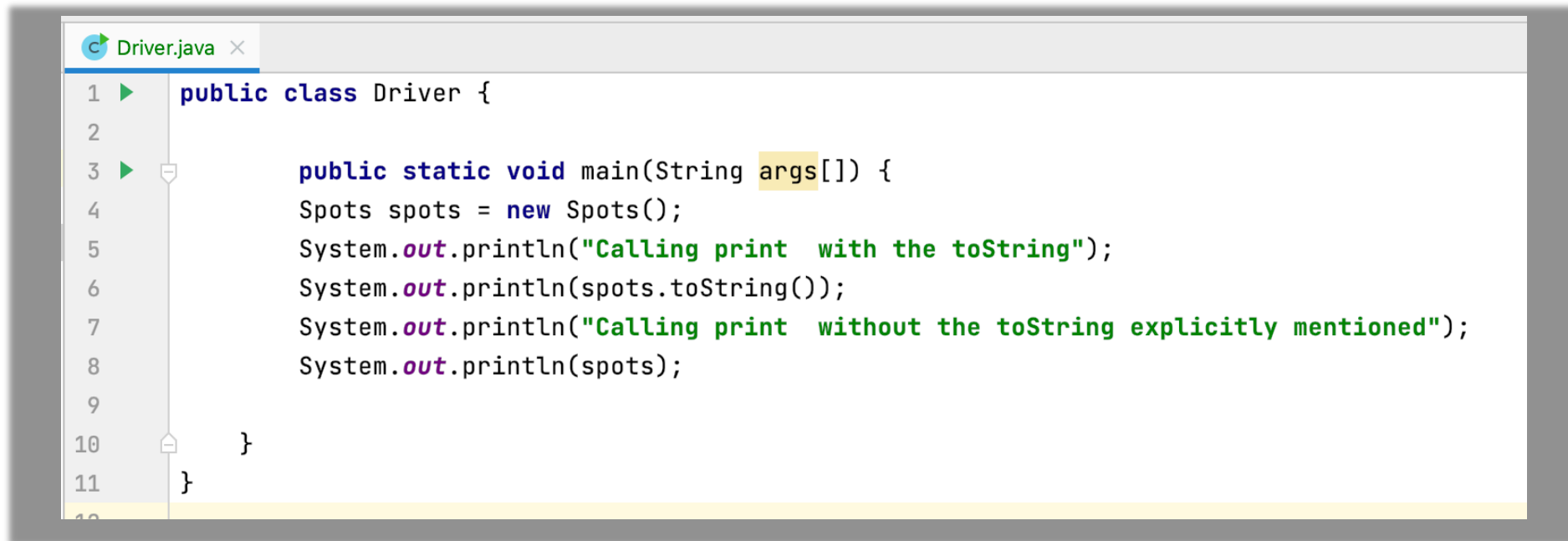
## Ex 2. We introduce Spots which contains an array of Spot

```
Spots.java x
12 private Spot[] manySpots;
13
14 Spots() {
15     manySpots = new Spot[4];
16
17     for (int i = 0; i < 4; i++) {
18         manySpots[i] = new Spot(x: i * 10, y: i * 10);
19     }
20 }
21 public String toString() {
22     String str = "";
23     for (int i = 0; i < 4; i++) {
24         str += "Spot number : " + i + " : " + manySpots[i];
25     }
26     return str;
27 }
28 }
```

Spots Class – Note the toString() – needs a loop)

# Using toString()

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```
Driver.java x
1  ▶ public class Driver {
2
3  ▶  ▶ public static void main(String args[]) {
4      Spots spots = new Spots();
5      System.out.println("Calling print with the toString");
6      System.out.println(spots.toString());
7      System.out.println("Calling print without the toString explicitly mentioned");
8      System.out.println(spots);
9
10     }
11 }
```

Driver Class using toString() on spots – note similarity

# Questions?



# References

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- Reas, C. & Fry, B. (2014) Processing – A Programming Handbook for Visual Designers and Artists, 2<sup>nd</sup> Edition, MIT Press, London.