Using Objects and Methods

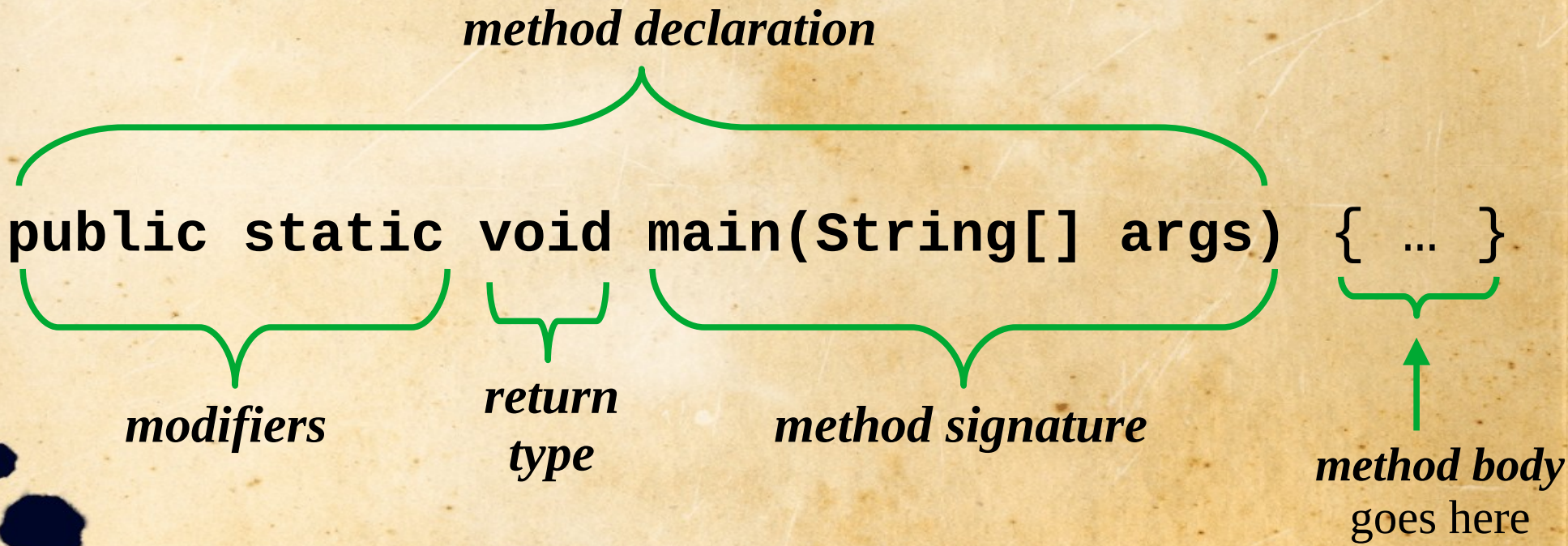
Method Signatures

Lecture Contents

- Method Declaration
- The `main` Method

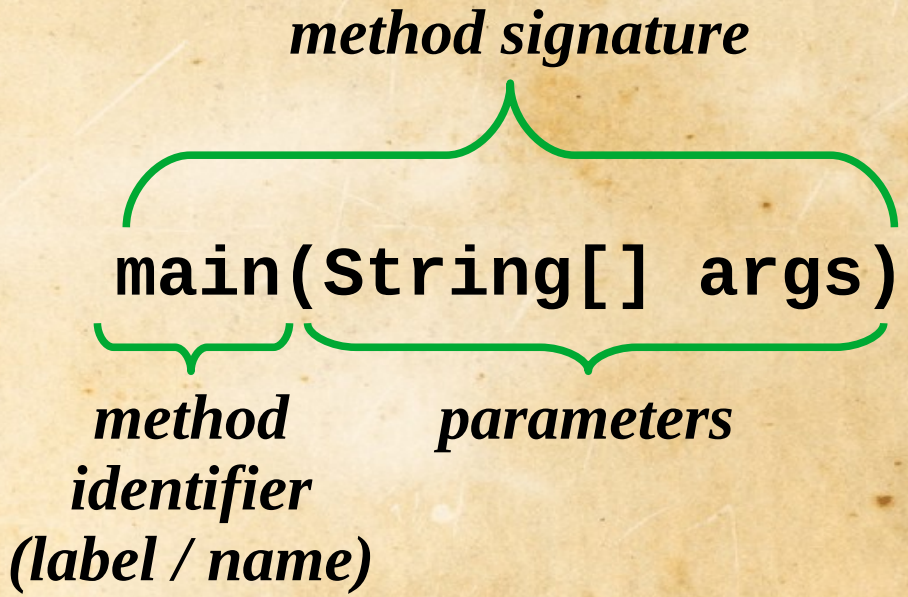
Method Declaration

- These are the parts of the method declaration.



Method Declaration

- These are the parts of the ***method signature***.



Basic Methods

```
public class HelloWorld {

   public static void main(String[] args) {
      System.out.println("Hello World!");
   }

}
```

```
Hello World!
```

A Java program starts execution by running the **`main`** method.

Basic Methods

- The code below has two methods, a **`main`** method, and a method called **`myMethod`**. Each method declaration is in bold.

```
public class HelloWorld {

  public static void main(String[] args) {
    myMethod();
  }

  public static void myMethod( ) {
    System.out.println("Hello World!");
  }
}
```

Basic Methods

- We can ***call*** another method by writing the method name, followed by any ***parameters*** in parentheses.
  - The example method does not have any ***parameters***.

```
public class HelloWorld {

   public static void main(String[] args) {
      myMethod();
   }

   public static void myMethod() {
      System.out.println("Hello World!");
   }
}
```

Basic Methods

- We can ***call*** another method by writing the method name, followed by any ***parameters*** in parentheses.
  - The example method does not have any ***parameters***.

```
public class HelloWorld {

   public static void main(String[] args) {
      myMethod();
   }

   public static void myMethod() {
      System.out.println("Hello World!");
   }
}
```

```
Hello World!
```

Predict the Output

```
public class HelloWorld {

   public static void main(String[] args) {
      int myNumber = 13;
      System.out.println(myNumber);
      myMethod();
   }

   public static void myMethod( ) {
      System.out.println("Hello World!");
   }
}
```

Predict the Output

```
public class HelloWorld {

   public static void main(String[] args) {
      int myNumber = 13;
      System.out.println(myNumber);
      myMethod();
   }

   public static void myMethod( ) {
      System.out.println("Hello World!");
   }
}
```

```
13
Hello World!
```

Predict the Output

```
public class HelloWorld {

   public static void main(String[] args) {
      int myNumber = 13;
      myMethod();
      System.out.println(myNumber);
   }

   public static void myMethod( ) {
      System.out.println("Hello World!");
   }
}
```

Predict the Output

```
public class HelloWorld {

   public static void main(String[] args) {
      int myNumber = 13;
      myMethod();
      System.out.println(myNumber);
   }

   public static void myMethod( ) {
      System.out.println("Hello World!");
   }
}
```

```
Hello World!
13
```

A Method with One Parameter

- A parameter is a variable declared in the method signature parameter list (inside the parentheses following the method identifier.

```
public class HelloWorld {

   public static void main(String[] args) {
        myMethod(6);
   }

   public static void myMethod(int i) {
      System.out.println(i);
      System.out.println(i);
   }
}
```

A Method with One Parameter

- A parameter is a variable declared in the method signature parameter list (inside the parentheses following the method identifier.

```
public class HelloWorld {

   public static void main(String[] args) {
        myMethod(6);
   }

   public static void myMethod(int i) {
      System.out.println(i);
      System.out.println(i);
   }
}
```

```
6
6
```

Multiple Parameters

- A method can take any number of parameters. The follow example method takes two parameters of type `int`.

```
public class HelloWorld {

    public static void main(String[] args) {
        printTime(3,30);
    }

    public static void printTime(int hour, int min) {
        System.out.println(hour + ":" + min);
    }
}
```

Predict the output...

Multiple Parameters

- A method can take any number of parameters. The follow example method takes two parameters of type `int`.

```
public class HelloWorld {

    public static void main(String[] args) {
        printTime(3,30);
    }

    public static void printTime(int hour, int min) {
        System.out.println(hour + ":" + min);
    }
}
```

```
3:30
```

Practice: `calculateBMI` method

- A person's body mass index (BMI) is calculated by the person's weight in kilograms divided by the square of the person's heigh.

$$BMI = \frac{weight\,[kg]}{(height\,[m])^2}$$

- Write a method `calculateBMI` that takes two double parameters – `weight` and `height`, and calculates the person's BMI.

Write the method "writeSquare"

```
public class HelloWorld {

   public static void main(String[] args) {
        int i = 3;
        writeSquare(i);
        writeSquare(i+2);
   }

   public static void writeSquare(int x) {
      // TODO: Write the code for this method!!
   }
}
```

```
The square of 3 is 9.
The square of 5 is 25.
```

Write the method “writeSquare”

```
public class HelloWorld {

   public static void main(String[] args) {
        int i = 3;
        writeSquare(i);
        writeSquare(i+2);
   }

   public static void writeSquare(int x) {
      System.out.println("The square of " + x + " is " + x*x + ".");
   }
}
```

```
The square of 3 is 9.
The square of 5 is 25.
```

Method Return Values

```
public class HelloWorld {

   public static void main(String[] args) {
      int i = getFive();
      System.out.println("The method returned " + i + ".");
    }

   public static int getFive() {
      return 5;
   }
}
```

```
The method returned 5.
```

Write the method “getSquare”

```
public class HelloWorld {

   public static void main(String[] args) {
      int i = 3;
      int j = getSquare(i);
      System.out.println("The square of " + i + " is " + j + ".");
    }

   public static int getSquare(int x) {
      // TODO: Write the code for this method!!
   }
}
```

```
The square of 3 is 9.
```

Write the method “getSquare”

```
public class HelloWorld {

   public static void main(String[] args) {
      int i = 3;
      int j = getSquare(i);
      System.out.println("The square of " + i + " is " + j + ".");
    }

   public static int getSquare(int x) {
      return x * x;
   }
}
```

```
The square of 3 is 9.
```

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