Java Encapsulation

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Encapsulation

The meaning of **Encapsulation**, is to make sure that "sensitive" data is hidden from users. To achieve this, you must:

- declare class variables/attributes as `private`
- provide public **get** and **set** methods to access and update the value of a `private` variable

Get and Set

You learned from the previous chapter that `private` variables can only be accessed within the same class (an outside class has no access to it). However, it is possible to access them if we provide public **get** and **set** methods.

The `get` method returns the variable value, and the `set` method sets the value.

Syntax for both is that they start with either `get` or `set`, followed by the name of the variable, with the first letter in upper case:

Example

```
public class Person {
  private String name; // private = restricted access

  // Getter

    return name;
  }

  // Setter

    this.name = newName;
  }
}
```

Example explained

The `get` method returns the value of the variable `name` .

The `set` method takes a parameter (`newName`) and assigns it to the `name` variable. The `this` keyword is used to refer to the current object.

However, as the `name` variable is declared as `private` , we **cannot** access it from outside this class:

Example

```
public class Main {
  public static void main(String[] args) {
    Person myObj = new Person();
    myObj.name = "John";  // error
    System.out.println(myObj.name); // error
  }
}
```

Run Example »

If the variable was declared as `public` , we would expect the following output:

```
John
```

However, as we try to access a `private` variable, we get an error:

```
MyClass.java:4: error: name has private access in Person
    myObj.name = "John";
         ^
MyClass.java:5: error: name has private access in Person
    System.out.println(myObj.name);
                  ^
2 errors
```

Instead, we use the `getName()` and `setName()` methods to access and update the variable:

Example

```
public class Main {
  public static void main(String[] args) {
    Person myObj = new Person();



  }
}

// Outputs "John"
```

Try it Yourself »

Why Encapsulation?

- Better control of class attributes and methods
- Class attributes can be made **read-only** (if you only use the `get` method), or **write-only** (if you only use the `set` method)
- Flexible: the programmer can change one part of the code without affecting other parts
- Increased security of data

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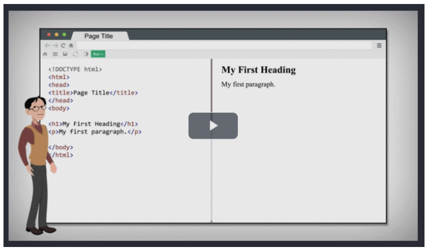


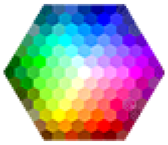
```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

My First Heading

My first paragraph.



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