Java Encapsulation

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

  public String getName() {

    return name;

  }


  // Setter

  public void setName(String newName) {

    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

  }

}
```

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

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();

    myObj.setName("John"); // Set the value of the name variable to "John"

    System.out.println(myObj.getName());

  }

}


// Outputs "John"
```