

ENCAPSULATION

Fundamentals

- **Encapsulation** describes the ability of an object to hide its data and methods.
- Benefits of encapsulation:
 - It allows writing of reusable programs.
 - It restricts access only to those features of an object that are declared public.
- In Java, a class encapsulates the fields, which holds the state of an object, and the methods, which define the actions of the object.
- Fields are encapsulated by declaring instance variables as private and methods as public.
- An **accessor** or a getter method is a public method that returns data from a private instance variable.
- A **mutator** or a setter method is a public method that changes the data stored in one or more private instance variables.

Example:

```
public class Student {
    private String name;
    public void setName(String name) {
        this.name = name;
    }
    public String getName() {
        return name;
    }
}
```

Rules in Implementing Encapsulation

1. Instance variables are declared private.
Ex. private String name;
2. Names of getter methods begin with get if the property is not a boolean.
Ex. public String getName() {
 return name;
}
3. Names of getter methods begin with is if the property is a boolean.

```
Ex. public boolean isEnrolled() {
    return status;
}
```

4. Names of setter methods begin with set.
Ex. public void setName(String name) {
 this.name = name;
}

Immutable Classes

- A class is considered **immutable** if it remains unchanged after an object of another class is constructed.
- For a class to be immutable, remove the setter methods and use the constructor for setting the values.

Example:

```
public class Student {
    private String name;
    public Student(String name) {
        this.name = name;
    }
    public String getName() {
        return name;
    }
}
```

References:

Savitch, W. (2014). *Java: An introduction to problem solving and programming* (7th ed.). New Jersey: Pearson Education, Inc.
Oracle Docs (n.d.). *Citing sources*. Retrieved from <https://docs.oracle.com/javase/tutorial/java/javaOO/index.html>