Object Oriented Programming (JAVA)



## Semester: Fall 2024

**Software Engineering**

**Faculty of Information Technology UCP Lahore, Pakistan**

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| **Week 5** | |
| **Topic** | **Passing and returning objects, array of objects, Copy Constructors, Object Referencing and Garbage Collection** |
| **Objective** | * Understanding how to pass and return objects in Java through member functions. * Learn how to initialize, access, and modify arrays of objects in Java. * Differentiate between deep copy and shallow copy in Java objects. * Explore object referencing and understand Java’s garbage collection mechanism. |

**Class Participation 01**

**Task 1: Define the SmartFan Class**

**Objective**: Create a class that represents a smart fan.

**Instructions**:

1. Create a SmartFan class with the following attributes:

* String fanName (e.g., "Bedroom Fan")
* boolean isOn (initially false)

2. Add the following methods:

* void turnOn(): turns the fan on.
* void turnOff(): turns the fan off.
* String getStatus(): returns "On" or "Off" based on fan status.

3. Create a class SmartHomeController where:

* You pass a SmartFan object to a method operateFan(SmartFan fan) that turns ON the fan and returns the modified object.
* Print the status before and after passing the object to the method.

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| **Expected Output**:  Initial Fan status: Off  After operation: On |

**Task 2: Using Arrays of Objects in Java**

**Instructions**:

1. Extend the SmartFan class from Task 1.
2. In SmartHomeController, create an array of 5 SmartFan objects, each representing a different fan in the house.
3. Write methods to:

* Initialize the array with default fan names, such as:
  + "Bedroom Fan", "Kitchen Fan", "Living Room Fan", "Bathroom Fan", "Garage Fan"
* Turn ON all the fans.
* Print their statuses.

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| **Expected Output**:  Bedroom Fan status: On  Kitchen Fan status: On  Living Room Fan status: On  Bathroom Fan status: On  Garage Fan status: On |