**Exercise 9: Implementing the Command Pattern**

**Scenario:**

You are developing a home automation system where commands can be issued to turn devices on or off. Use the Command Pattern to achieve this.

**Steps:**

**1. Create a New Java Project:**

* **Project Name**: CommandPatternExample
* Use your preferred IDE (like IntelliJ IDEA, Eclipse, or NetBeans) to create a new Java project.

**2. Define Command Interface:**

**Command Interface**:

* Create an interface Command with a method execute().

public interface Command {

void execute();

}

**3. Implement Concrete Commands:**

**LightOnCommand Class**:

* Create a class LightOnCommand that implements Command.

public class LightOnCommand implements Command {

private Light light;

public LightOnCommand(Light light) {

this.light = light;

}

@Override

public void execute() {

light.turnOn();

}

}

**LightOffCommand Class**:

* Create a class LightOffCommand that implements Command.

public class LightOffCommand implements Command {

private Light light;

public LightOffCommand(Light light) {

this.light = light;

}

@Override

public void execute() {

light.turnOff();

}

}

**4. Implement Invoker Class:**

**RemoteControl Class**:

* Create a class RemoteControl that holds a reference to a Command and a method to execute the command.

public class RemoteControl {

private Command command;

// Set the command to be executed

public void setCommand(Command command) {

this.command = command;

}

// Execute the command

public void pressButton() {

command.execute();

}

}

**5. Implement Receiver Class:**

**Light Class**:

* Create a class Light with methods to turn on and off.

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public class Light {

public void turnOn() {

System.out.println("The light is on.");

}

public void turnOff() {

System.out.println("The light is off.");

}

}

**6. Test the Command Implementation:**

**TestCommandPattern Class**:

* Create a test class to demonstrate issuing commands using the RemoteControl.

public class TestCommandPattern {

public static void main(String[] args) {

// Create the receiver

Light livingRoomLight = new Light();

// Create command objects

Command lightOn = new LightOnCommand(livingRoomLight);

Command lightOff = new LightOffCommand(livingRoomLight);

// Create the invoker

RemoteControl remote = new RemoteControl();

// Turn the light on

remote.setCommand(lightOn);

remote.pressButton();

// Turn the light off

remote.setCommand(lightOff);

remote.pressButton();

}

}