**Object-Oriented Programming (OOP) Activity**

📌 **File Name:** Python\_activity14.py  
**Instructions:** Implement the following programs using Python, ensuring each follows OOP principles. Save your work as Python\_activity14.py.

**1. Encapsulation: AI Chatbot with User Profiles**

Create a UserProfile class that stores user information.

* The class should have a **private attribute** to store the user's password.
* Implement a method that allows the user to change their password securely.
* Ensure the password **cannot** be accessed directly.

**2. Inheritance: Smart Appliances**

Design a SmartDevice class with basic attributes like brand and status (On/Off).

* Create two subclasses, SmartLight and SmartThermostat.
* SmartLight should have an extra method to adjust brightness.
* SmartThermostat should have an extra method to set temperature.
* Ensure the subclasses inherit attributes and methods from SmartDevice.

**3. Polymorphism: E-commerce Payment System**

Develop a PaymentMethod interface with a pay(amount) method.

* Implement two classes, CreditCard and PayPal, that override pay().
* Simulate a checkout system where a customer can pay using either method.

**4. Abstraction: AI Image Recognition System**

Create an **abstract class** ImageRecognitionModel with a method analyze\_image().

* Implement two subclasses, FaceRecognition and ObjectRecognition.
* Each subclass should provide a **different** way of analyzing images.

📌 **Reminder:**

* Save your Python file as Python\_activity14.py.
* Ensure all four tasks are included in a **single file** with clear **comments** for each section.
* Run test cases to verify correctness before submission.