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Savtoa Technologies – Round 2 Technical Assessment

Question1: Simple Smart Device Control System

2.1 Understanding of the Problem Statement

This problem is about building a small device control system using Python and object-oriented programming.

The system should work with different devices like a Motor and a Light.
Each device should be able to turn ON and OFF and should keep track of its own current state.The ON or OFF status of a device should be handled only inside the device itself. Outside code should not be allowed to change this state directly.

A controller needs to be created that can work with any device.The controller should not depend on the type of device it is controlling. The design should allow new devices to be added later without changing the existing controller code.

2.2 Approach and Design

To solve this problem, object-oriented programming concepts are used.A base class called Device is created to represent common behavior for all devices.This class stores the ON/OFF state and provides a method to check the current status of the device.

The state is protected so that it cannot be changed directly from outside the class.The Motor and Light classes are created by inheriting from the Device class.Each of these classes defines its own behavior for turning ON and OFF by printing different messages.

A Controller class is created separately.
It does not know the details of any specific device.
It simply calls the `start()` and `stop()` methods on the device object it receives.
This makes the system flexible and easy to extend.

2.3 Solution Explanation

The Device class acts as a common template for all devices.It defines what every device should be able to do and stores the device state internally.The Motor and Light classes inherit from this base class and implement their own ON and OFF behavior.

They update the internal state and display the correct output message when started or stopped. The Controller class contains a method that accepts any device object.This method turns the device ON and then turns it OFF.Since the controller works with the base Device class, it will work for any new device added in the future.

Finally, driver code is written to create objects for Motor and Light, assign them to controllers, and run the operations.

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3. Testing and Verification

The program was tested by running the controller with Motor and Light objects.
The output produced by the program matched the expected output given in the question.
The program runs without errors and correctly controls the devices.
