Day 99/180 Object Oriented Programming

3 Programming Challenges with Classes:

1. Bank Customer Class:

Challenge: Design a `Customer` class for a bank system that manages customer information and basic operations.

Attributes:

- `name`: String containing the customer's full name.
- `accountNumber`: Unique integer identifying the customer's account.
- `accountBalance`: Double representing the current balance in the account.
- `isActive`: Boolean indicating whether the account is active.

Methods:

- `deposit(amount)`: Adds the specified amount to the account balance.
- `withdraw(amount)`: Deducts the specified amount from the account balance (check for sufficient funds).
- `transfer(amount, targetAccount)`: Transfers the specified amount to another customer's account (within the system).
- `printDetails()`: Prints the customer's name, account number, and current balance.

2. Car Class:

Challenge: Create a `Car` class that simulates the behavior of a vehicle.

Attributes:

- `model`: String representing the car model name.
- `year`: Integer indicating the car's manufacturing year.
- `fuelLevel`: Double representing the remaining fuel quantity (percentage or liters).
- `speed`: Integer representing the current speed in kilometers per hour.
- `isRunning`: Boolean indicating whether the car is currently running.

Methods:

- `startEngine()`: Sets `isRunning` to true and prints a starting message.
- `stopEngine()`: Sets `isRunning` to false and prints a stopping message.
- `accelerate(amount)`: Increases the car's speed by the specified amount (check engine state and fuel level).
- `brake(amount)`: Decreases the car's speed by the specified amount (ensure speed doesn't become negative).
- `refuel(amount)`: Increases the fuel level by the specified amount (check for tank capacity).
- `printStatus()`: Displays the car's model, speed, fuel level, and running state.

3. Laptop Class:

Challenge: Design a `Laptop` class that represents a portable computer system.

Attributes:

- `brand`: String representing the laptop brand and model.
- `screenSize`: Double indicating the screen size in inches.
- `processor`: String specifying the processor type and speed.
- `ram`: Integer representing the available RAM capacity in gigabytes.

- `storage`: Integer representing the storage capacity in gigabytes.
- `batteryLevel`: Double showing the remaining battery percentage.
- `isOn`: Boolean indicating whether the laptop is currently powered on.

Methods:

- `powerOn()`: Sets `isOn` to true and prints a startup message.
- `powerOff()`: Sets `isOn` to false and prints a shutdown message.
- `openApps(numApps)`: Simulates opening a specified number of applications, potentially impacting battery life.
- `closeApps(numApps)`: Simulates closing applications, restoring battery life.
- `charge(amount)`: Increases the battery level by the specified amount (check for maximum capacity).
- `printSpecs()`: Displays the laptop's brand, screen size, processor, RAM, storage, and battery level.