Course Title: Object Oriented Programming

Lab Assignment 1: Pharmacy Shop Management System

Date : **27-09-2024** Maximum Marks: **20**
CLO : **4**

Scenario

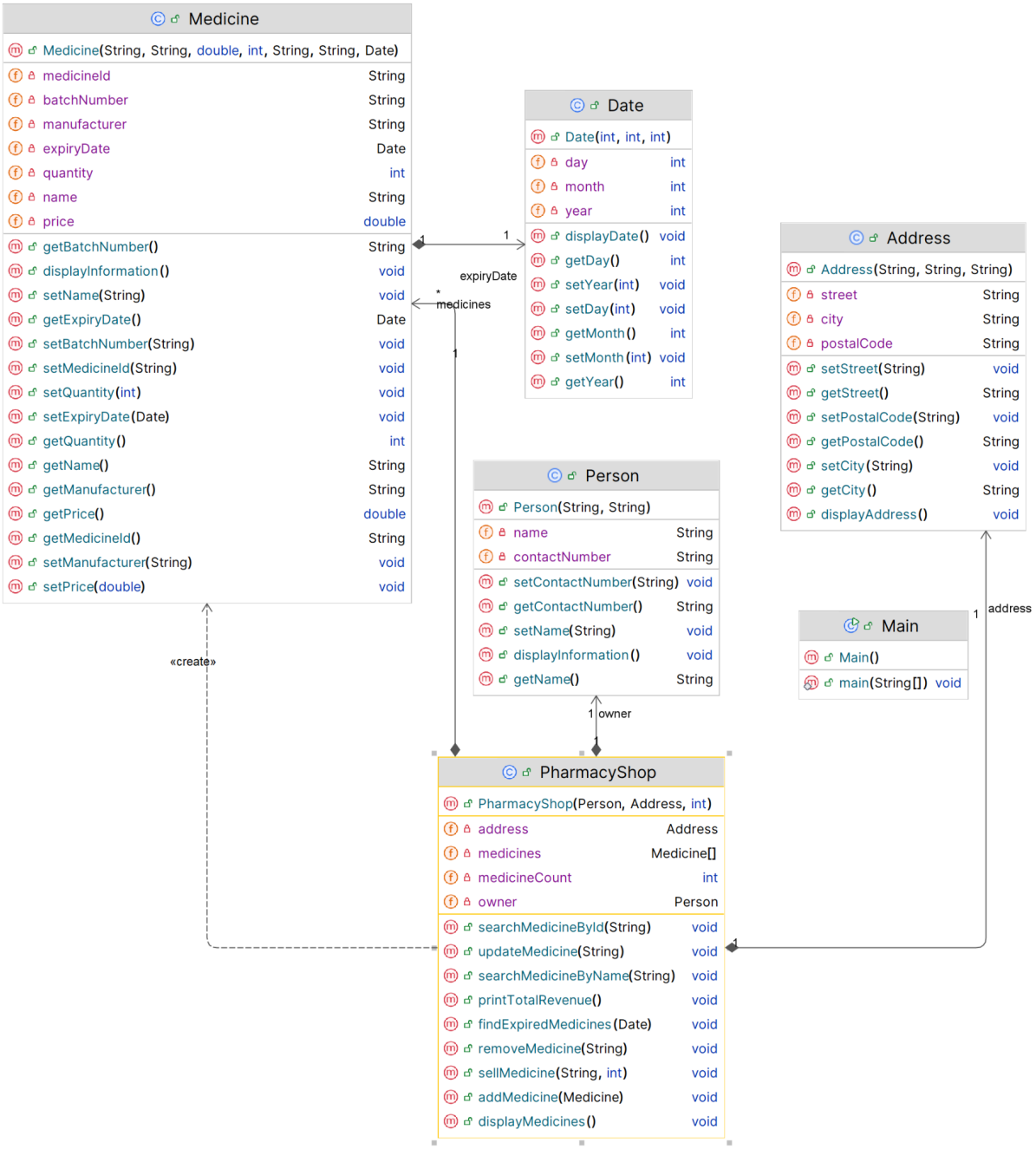
Pharmacy Name: HealthPlus Pharmacy

You have been hired by **HealthPlus** Pharmacy, a local pharmacy shop in Karachi, Pakistan, to develop a simple in-memory management system. The system will help the shop manage its inventory of medicines, track expiry dates, and maintain information about the shop owner and address. This system will not use a database; instead, all data will be stored in memory using Java objects and arrays.

Background:

HealthPlus Pharmacy is owned by a dedicated pharmacist, Ahmed Khan, who wants to ensure that all medicines are up-to-date and that expired medicines are promptly identified and removed from the shelves. The pharmacy stocks a variety of medicines, each with specific attributes such as a unique ID, name, price, quantity, manufacturer, batch number, and expiry date. The expiry date is crucial for ensuring the safety and effectiveness of the medicines provided to customers.

The **UML diagram** of the system is given for your understanding.



System Requirements:

1. **Owner Information:**
    - The system should store information about the pharmacy owner, including their name and contact number. This information is essential for record-keeping and communication purposes.

2. **Pharmacy Address:**
    - The pharmacy's address should be stored using a separate `Address` class, which includes attributes such as street, city, and postal code.
3. **Medicine Inventory:**
    - The pharmacy stocks multiple medicines. Each medicine has a unique ID, name, price, quantity, manufacturer, batch number, and expiry date. The expiry date should be managed using a separate `Date` class to encapsulate the day, month, and year.
4. **Inventory Management:**
    - The system should provide a console-based menu with options to:
        - Add a new medicine.
        - Update existing medicine details.
        - Remove a medicine from the inventory.
        - Sell a medicine (reduce quantity and calculate revenue).
        - Display all available medicines.
        - Search for a medicine by ID or name.
        - Print total revenue from sales.
        - Identify and list expired medicines based on the current date.

Classes and Their Roles:

- **Person Class (Owner):**
    - Represents the owner of the pharmacy.
    - Stores the owner's name and contact number.
- **Address Class:**
    - Represents the address of the pharmacy.
    - Stores the street, city, and postal code.
- **Date Class (Expiry Date):**
    - Represents the expiry date of a medicine.
    - Stores the day, month, and year.
- **Medicine Class:**
    - Represents a medicine in the pharmacy.
    - **Attributes:**
        - `medicineId` (String): A unique identifier for the medicine.
        - `name` (String): The name of the medicine.
        - `price` (double): The price of the medicine.
        - `quantity` (int): The quantity of the medicine in stock.

        - `manufacturer` (String): The name of the manufacturer.
        - `batchNumber` (String): The batch number of the medicine.
        - `expiryDate` (Date): The expiry date of the medicine.
    - **Methods:**
        - **Constructor:** Initialize all attributes.
        - **Getters and Setters:** Access and modify each attribute.
        - **Display Information:** Print the medicine's details, including the expiry date.
- **PharmacyShop Class:**
    - Represents the pharmacy shop itself.
    - Stores the owner (using the `Person` class), address (using the `Address` class), and an array of medicines.
    - Provides methods to manage the inventory and interact with the console-based menu.
- **Driver Class (Main):**
    - Serves as the entry point for the application.
    - Creates instances of the `Person`, `Address`, `Medicine`, and `PharmacyShop` classes.
    - Implements the console-based menu to interact with the user and perform various operations.

Instructions

1. **Setup:**
    - Use Notepad or any text editor to write your Java code.
    - Use Command Prompt to compile and run your Java programs.
2. **Implementation:**
    - Implement each class in a separate Java file.
    - Use arrays to manage the collection of medicines in the `PharmacyShop` class.
    - Use composition to associate `Medicine` with `Date`, `PharmacyShop` with `Person`, and `Address`.
3. **Console-Based Menu:**
    - Implement a loop in the `Main` class to display a menu and prompt the user for input.
    - Use switch-case or if-else statements to handle different menu options.
    - Implement search functionality to find medicines by their unique ID or name.
4. **Compilation and Execution:**

    - Compile your Java files using the command: `javac *.java`
    - Run your program using the command: `java Main`
5. **Submission:**

    - Create a GitHub repository named "Lab-Assignment-1-Pharmacy-Shop".
    - Push your code to the repository.
    - Submit the GitHub repository link via the provided Google Form: https://forms.gle/XeE4XYVfR5DiQcQs6

Evaluation Criteria

- **Correctness (60%):** Proper implementation of classes, methods, and array management.
- **OOP Principles (20%):** Effective use of composition and encapsulation.
- **Code Style (10%):** Readability, meaningful variable names, and comments.
- **Version Control (10%):** Proper use of Git and GitHub for submission.

This enhanced assignment provides a comprehensive exercise in applying object-oriented programming concepts, focusing on arrays, composition, and user interaction through a console-based menu. The inclusion of additional attributes in the `Medicine` class offers a more realistic representation of a pharmacy's inventory management system.

Supplementary Data:

Example Medicine Details

Here are 10 sample medicines with their attributes:

1. **Paracetamol**

    - ID: M001
    - Price: 50.0
    - Quantity: 100
    - Manufacturer: PharmaCorp
    - Batch Number: B123
    - Expiry Date: 15/08/2025
2. **Ibuprofen**

    - ID: M002
    - Price: 75.0
    - Quantity: 80

    - Manufacturer: HealthMed
    - Batch Number: B124
    - Expiry Date: 10/12/2024
3. **Amoxicillin**

    - ID: M003
    - Price: 120.0
    - Quantity: 50
    - Manufacturer: BioPharma
    - Batch Number: B125
    - Expiry Date: 20/05/2026
4. **Ciprofloxacin**

    - ID: M004
    - Price: 150.0
    - Quantity: 60
    - Manufacturer: MedLife
    - Batch Number: B126
    - Expiry Date: 30/11/2025
5. **Metformin**

    - ID: M005
    - Price: 90.0
    - Quantity: 70
    - Manufacturer: GlucoCare
    - Batch Number: B127
    - Expiry Date: 25/07/2024
6. **Aspirin**

    - ID: M006
    - Price: 40.0
    - Quantity: 150
    - Manufacturer: PainRelief
    - Batch Number: B128
    - Expiry Date: 05/03/2025
7. **Lisinopril**

    - ID: M007
    - Price: 110.0
    - Quantity: 90
    - Manufacturer: CardioHealth
    - Batch Number: B129
    - Expiry Date: 18/09/2026

8. **Atorvastatin**
    - ID: M008
    - Price: 130.0
    - Quantity: 40
    - Manufacturer: CholesterolCare
    - Batch Number: B130
    - Expiry Date: 12/01/2025
9. **Omeprazole**
    - ID: M009
    - Price: 85.0
    - Quantity: 110
    - Manufacturer: DigestWell
    - Batch Number: B131
    - Expiry Date: 22/06/2024
10. **Losartan**
    - ID: M010
    - Price: 95.0
    - Quantity: 65
    - Manufacturer: BloodPressurePlus
    - Batch Number: B132
    - Expiry Date: 14/02/2026