Small Clinic Management System - Documentation

1. Object-Oriented Analysis (OOA) Model

+ Patient: Represents a patient, with attributes such as name, ID, age, and medical history.

+ ChronicPatient: Inherits from class Patient, adding chronic condition details and the date of the most recent follow-up.

+ Doctor: Represents a doctor, including name, specialty, and the ability to be associated with appointments.

+ Appointment: Represents an appointment, containing date, time, reason, and status.

- > Inheritance relationship: The class ChronicPatient is a subclass of Patient. It overrides the appointment scheduling method to require more frequent regular follow-ups.

2. Explanation of Class Design

Object-oriented analysis helps keep the code clean and easy to extend. Classes are encapsulated with private or protected attributes and public methods to ensure safety.

+ Patient (base class): manages general patient information.

+ ChronicPatient (derived class): overrides the scheduleAppointment method to enforce a stricter appointment schedule.

+ Doctor: manages doctor information and specialty.

+ Appointment: manages appointment details and status (Scheduled, Completed, Canceled).

3. Code Walkthrough

Key Parts of the Program:

+ The scheduleAppointment() method in the Patient class allows scheduling an appointment.

+ ChronicPatient overrides this method to add the requirement for regular follow-up appointments.

+ The Appointment class includes complete() and cancel() methods to update the appointment status.

+ The main() function creates objects (Patient, ChronicPatient, Doctor, Appointment) and demonstrates how to use them.

4. Test Results

- Example console output from running the program:

Patient: Tai, ID: 101, Age: 30

Appointment scheduled for Tai on 24-09-2025 (Reason: General checkup)

Patient: Bao, ID: 102, Age: 55

Condition: Diabetes, Last checkup: 09-09-2025

Chronic patient Bao (Diabetes) requires regular follow-up.

Appointment scheduled on 25-09-2025 (Reason: Cancer)

Doctor: Dr.Xuan Phung, Specialty: Cardiology + Internal Medicine

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Appointment: 15-09-2025 09:00 | Consultation | Status: Scheduled

Appointment: 15-09-2025 09:00 | Consultation | Status: Completed

- > This result proves that the system works properly: patients are created, doctors are displayed, and appointments can change status.

5. LLM Usage

During the writing of the program, I used ChatGPT to help me with the ideation and completion of the code. Specifically, I asked LLM to provide additional information to make the ChronicPatient code easier to complete, in addition to some lines of code about variable assignment. LLM saved me some ideation time, but I wrote most of the program myself and ran the entire code and tested it myself.