

Clinic Management System - Report

1. Object-Oriented Analysis (OOA)

Step 1: Identify objects (nouns) in the problem domain:

- Patient
- Doctor
- Appointment
- Clinic Manager

Step 2: Define relationships:

- A Patient can have zero or many Appointments.
- A Doctor can have zero or many Appointments.
- Each Appointment links one Patient and one Doctor.
- Clinic Manager manages collections of Patients, Doctors, and Appointments.

2. Class Design and Inheritance

The system uses inheritance to capture shared attributes and behaviors of humans (patients and doctors). The abstract base class Human enforces the `displayInfo()` interface, ensuring both Patients and Doctors implement their own display methods. Patients may be specialized further (e.g., `ChronicPatient`). The `ClinicManager` class acts as a controller to manage collections of objects and provide system operations.

3. Code Walkthrough

- `**Human (abstract class)**`: Defines the pure virtual method `displayInfo()`.
- `**Patient**`: Stores patient data (name, ID, age).
- `**Doctor**`: Stores doctor data (name, ID, specialization).
- `**Appointment**`: Links a Patient and a Doctor with a date/time.
- `**ClinicManager**`: Manages Patients, Doctors, and Appointments. Provides `add/list/cancel` functions.
- `**Main program**`: Provides a menu-driven interface for user interaction.

4. Test Results

Sample run of the program:

```
--- Patient List ---
Patient: John, Age: 30, ID: P1
Chronic Patient: Jane, Age: 40, ID: P2

--- Doctor List ---
Doctor: Smith, ID: D1, Spec: General
Doctor: Brown, ID: D2, Spec: Cardiology

--- Appointment List ---
Appointment: John with Dr. Smith on 2025-09-25 at 09:00
Appointment: Jane with Dr. Brown on 2025-09-26 at 14:00
```

These outputs confirm that patients and doctors were successfully added and appointments were scheduled correctly.

5. LLM Usage

I used ChatGPT as an assistant during the design and brainstorming phase. For example, I asked: "Suggest methods for an Appointment class in a clinic system." ChatGPT suggested having attributes for patient, doctor, date, and time, as well as a `displayInfo()` method. I adapted these ideas into my final code. While ChatGPT provided suggestions, I wrote and tested the actual C++ code myself.

End of Report