Object Oriented Analysis and Design

Assignment 3

Group 9

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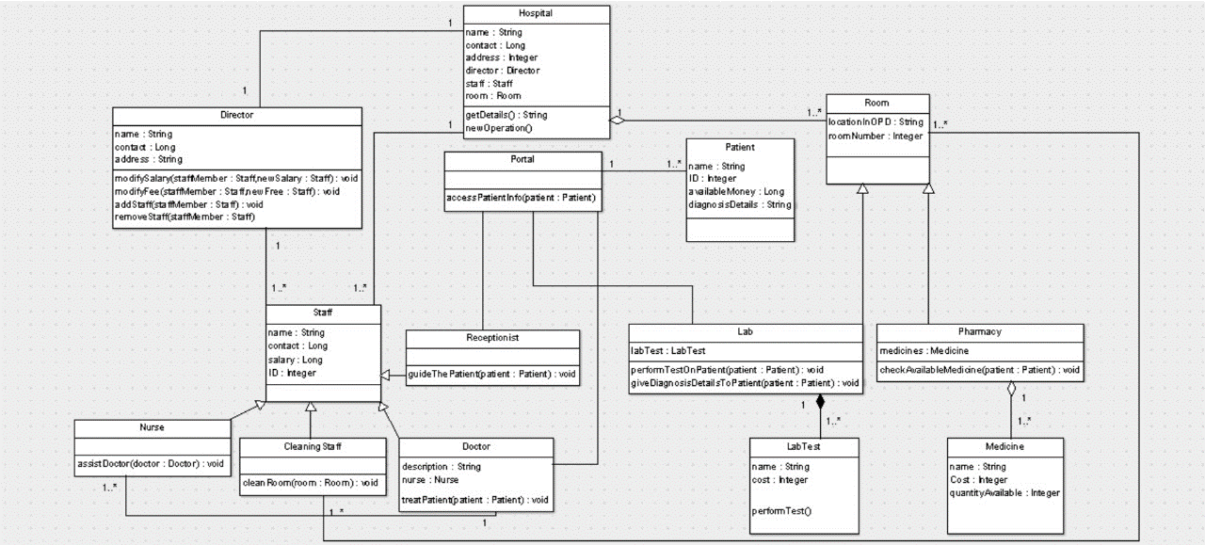

Different symbols used in the class diagram:

1. Lab and labtest:

   They exhibit composition. Composition represents a strong ownership relationship where one class (the whole) is responsible for the creation, management, and destruction of another class (the part). Here's why the relationship between "lab" and "labtest" might be considered a composition:

   The "lab" class exclusively owns instances of the "labtest" class. This means that a "labtest" object is created and managed by a "lab," and it cannot exist independently outside of a "lab." In other words, if a "lab" is destroyed, its associated "labtest" objects are typically destroyed as well.

2. Pharmacy and Medicine:

   Pharmacy and Medicine have Aggregation. A "Pharmacy" class contains or is composed of instances of the "Medicine" class. Aggregation represents a relationship where one class (the whole) is made up of or contains instances of another class (the part). In this context, a "Pharmacy" can be seen as the whole, and "Medicine" can be seen as the part. A pharmacy holds and manages a collection of medicines.

   While "Pharmacy" may contain "Medicine" objects, it doesn't necessarily mean that the medicines are exclusively owned by the pharmacy. Medicines can exist independently of the pharmacy, and they can be shared among multiple pharmacies or other entities.

3. Hospital and Room:

Hospital and Room have aggregation. Aggregation signifies a "whole-part" relationship, where one class (the whole) contains or is composed of instances of another class (the part). Hospitals typically consist of various rooms, such as patient rooms, operating rooms, waiting rooms, etc. Each of these rooms is an integral part of the hospital's infrastructure.

"Hospital" can have multiple "Room" instances. You can specify different types of rooms and their properties within the "Room" class, and a "Hospital" can have a collection of these room instances.

4. Inheritance:

Inheritance in Object-Oriented Programming represents an "is-a" relationship, where a subclass (child) is a specialized version of a superclass (parent). For example,

a. Room is parent class and lab, and pharmacy are child classes.
b. Staff is parent class and nurse, cleaning staff, doctor and receptionist are all child classes.

Lab" rooms and "Pharmacy" rooms may share common attributes and behavior with regular "Room" objects. For example, they all have attributes like room number, capacity, and possibly methods related to room management.

Using inheritance, you can reuse the common attributes and behavior defined in the "Room" class for "Lab" and "Pharmacy" classes. This promotes code reuse and reduces redundancy.

5. Association:

For example, Director, staff, and Hospital; Receptionist, doctor, patient, Lab and Portal; Room and cleaning staff.

A "Director" in a hospital plays a significant role in hospital management. While a director may oversee the operations of one or more hospitals, they are not part of the structural composition of a hospital like rooms or staff. An association relationship is used to represent this connection without implying a "whole-part" relationship.

In an association relationship, "Director" and "Hospital" remain loosely coupled. This means that changes to one class (e.g., "Director") don't necessarily affect the other class (e.g., "Hospital") directly. It allows for flexibility in how you manage the associations.