Programming Assignment 3 Report

Programming Language : JAVA

Subject : Inheritance and Polymorphism

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INTRODUCTION AND PROBLEM DEFINITION

In this experiment we are asked to implement a hospital management system. We are given the current patient and admission lists. We take an input file and use the commends inside of it to manage the patient list, creating admissions, adding examinations to that admissions, and calculating the total examinations cost of admissions. And also we updated the admission and patient list after the changes.

DATA STRUCTURES

In this assignment we have used inheritance and polymorphism structures with some special patterns and architectures. One of them was The Decorator Pattern. This pattern was used for adding additional functionality to a particular object as opposed to a class of objects.

The Data Access Object layer was used for data access for writing to files.

SOLUTION AND ALGORTIHM

For the decorator pattern I have used an Examination interface and created ExaminationDecorator abstract class which implements the interface. Also I created Inpatient and Outpatient classes which are the examination types, to implement the interface. I used ExaminationDecorator as a super class and created some other subclasses of it like Imaging, Tests, DoctorVisit, Measurements which are the operation types. They all have these common methods;

addOperation(): calling this method with decorator pattern crates an examination object with its operations

printOperations(): method returns examination and operations in the given pattern as string

cost(): method returns cost of examination and operations as integer

I have design the decorator pattern in Hospital Class and I call these methods with pattern in that class.

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For creating the data access objects of patients I have used a Patient interface and created a PatientDAO class to implement it. This class includes these methods;

getByID(): method returns the requested patients data access object by giving the ID of the patient

deleteByID(): method removes and returns the patients data access object by giving the ID of the patient

add(): adds the given object to the array list

getAll(): returns the information of patients as string for writing to file

For the admissions I have used an Admission interface and implement it with AdmissionDAO class. Class has includes these methods;

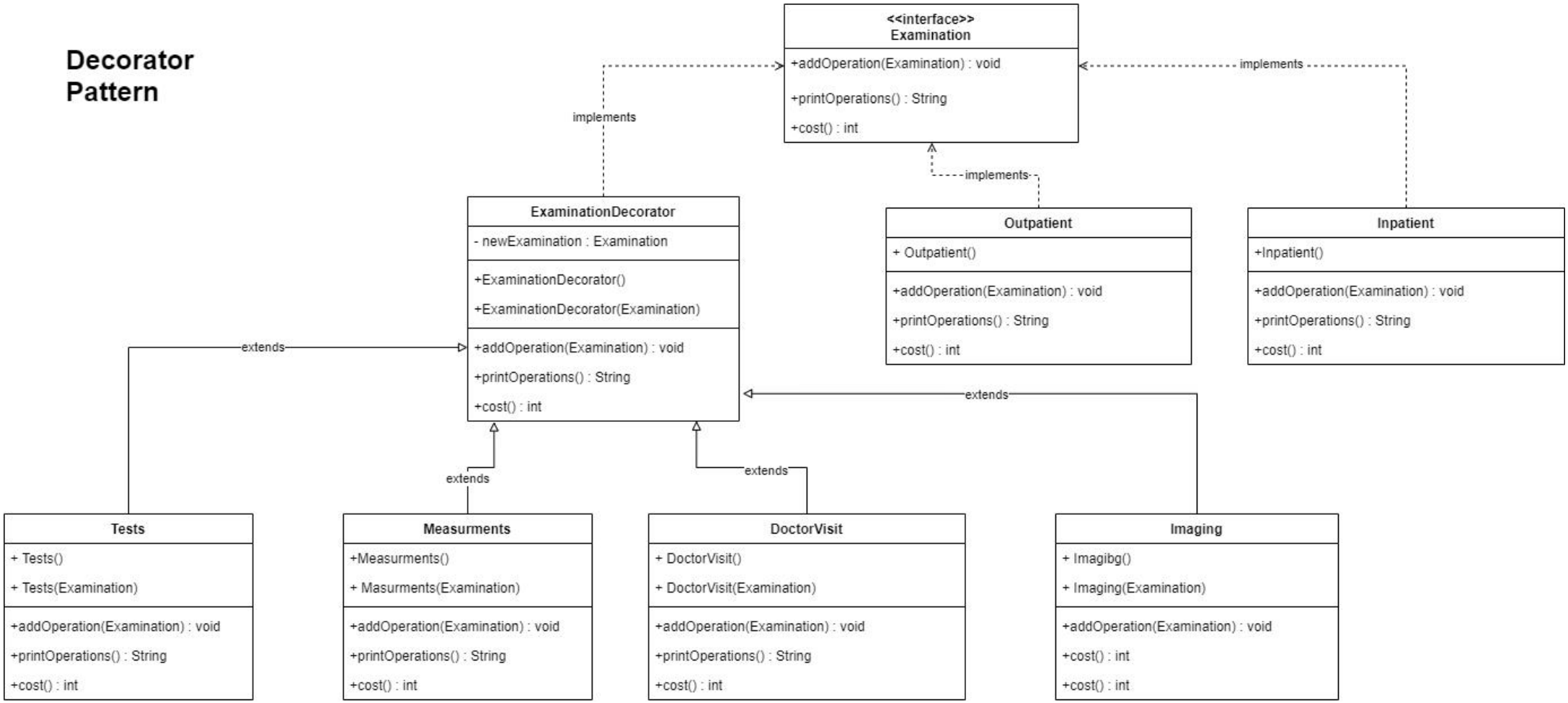
getByID(): returns the admissions of requested patient as list by ID

getAll(): returns the examinations of admissions for writing to file

I have used this classes and methods in the Hospital class to store and obtain data.

Other than these classes of structure I have used NameSorter, IDSorter and AdmissionIDSorter classes to sort the data while writing to file. In the Hospital class I have only one method which is readInputFile() this method takes input file as a string, analyze it and calls the required methods according to commands.

Decorator Pattern



Data Accsess Object