

Data Structures and Algorithms Project: Hospital Patient Management System

Course: Data Structures and Algorithms

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Project Overview

The objective of this project is to design and implement a console-based application in Java that solves a given problem by effectively utilizing appropriate data structures and algorithms. The application will be controlled entirely through text commands entered into the console (CLI). Your program's main function should read these commands, parse them, and call the appropriate Java methods to execute the actions.

The project must be written in Java as a standalone, CLI-based program by teams of two. No external databases or GUIs are to be used. You are permitted to use Java's standard data structure implementations from the `java.util` package.

Project Details: Hospital Patient Management System

This project's goal is to develop a system to manage patient information and appointments in a hospital setting. This project will require students to work with queues, stacks, and trees.

Core Requirements:

1. **Patient Records:** Each patient has a unique ID, name, age, and medical history. Store patient information using a binary search tree for efficient retrieval by patient ID.
2. **Appointment Scheduling:** Patients can book appointments, which are added to a queue and served in a first-come-first-served manner.
3. **Emergency Handling:** Patients with emergencies are added to a separate stack for immediate, last-in-first-out (LIFO) attention.
4. **Medical History:** Each patient's medical history is stored in a linked list under their profile.

Required Data Structures:

- **Binary Search Tree (BST):** For storing and retrieving patient records by ID.

- **Queue:** For managing regular appointment scheduling.
- **Stack:** For handling emergency appointments.
- **Linked List:** For storing a patient's medical history.

Required CLI Commands:

- `add_patient`
- `book_appointment`
- `emergency_appointment`
- `view_patient`

Submission and Evaluation

Your final submission must be a single `.zip` file containing all your `.java` source files. The project evaluation will be conducted through a final presentation and a Q&A session where you will demonstrate your application and explain your design choices.