National University of Computer and Emerging Sciences Islamabad

Software Design and Architecture Lab Spring 2024

Lab Assignment

Note: Make proper use of indentations. Outputs should be well-formatted. Submission guidelines are provided at the end. Failing to follow the guidelines will result in marks deduction.

Question 1: (submit fxml, controller and main file)

Create a comprehensive JavaFX application for managing a library system using Scene Builder. The application should allow users to perform various tasks such as adding, editing, and deleting books, as well as searching and sorting functionalities. Design the GUI for this application using JavaFX Scene Builder.

Main Window Design:

- Create a main window with a menu bar containing options for File (with sub-options: New, Open, Save, Save As, Exit), Edit (with sub-options: Add Book, Edit Book, Delete Book), and View (with sub-options: View All Books, Search Books).
- Implement appropriate event handlers for menu items.
- Include a status bar at the bottom to display system messages or information.

Book Management:

- Implement functionalities to add new books, edit existing book details, and delete books.
- Use a TableView to display the list of books with columns for Title, Author, ISBN, and Availability.
- Enable sorting of the book list based on column headers (Title, Author, ISBN).
- Implement validation for book details input fields (e.g., Title and Author fields should not be empty, ISBN should be in a valid format).

Search Functionality:

- Implement a search feature allowing users to search for books by Title or Author.
- Display the search results in the TableView.

Question 2: (submit all relevant files)

Meet Will, a 35-year-old agent residing in the bustling city. Recently, he's been experiencing persistent headaches and decides it's time to visit the hospital for a check-up.

Will walks into the hospital lobby, approaches the reception desk, where a friendly clerk asks for his details. Will provides his name, age, contact information, and a brief overview of his symptoms.

After verifying his information, the clerk provides Will with details related to specializations, contact information and availability schedules of various doctors. Will expresses his preference for Dr. Lecter, a neurologist renowned for his expertise in treating headaches.

The clerk checks Dr. Lecter's availability and finds a suitable slot for Will's appointment. They note down the appointment details, including the date, time, and reason for the visit. With the appointment confirmed, Will leaves the hospital feeling relieved, knowing he's taken the first step towards addressing his health concerns.

As the appointment day approaches, Will finds himself overwhelmed with work and realizes he won't be able to make it to his scheduled appointment with Dr. Lecter. With a sense of urgency, he decides to cancel the appointment to free up the slot for another patient in need.

Will contacts the hospital's reception desk, informing them of his decision to cancel the appointment. The clerk notes down Will's details and assures him that the appointment will be canceled promptly.

Meanwhile, in a separate part of the hospital, Dr. Bloom, a new addition to the medical team, arrives to update her availability schedule. As a specialist in internal medicine, Dr. Bloom understands the importance of ensuring her schedule aligns with the needs of her patients.

Dr. Bloom meets with the hospital administrator to discuss her availability. Together, they review Dr. Bloom's current schedule and make adjustments to accommodate upcoming appointments and personal commitments.

After finalizing the changes, Dr. Bloom provides the updated availability schedule to the hospital administrator, ensuring seamless coordination of patient appointments moving forward.

Back at the reception desk, Will breathes a sigh of relief knowing that his appointment has been canceled, allowing him to focus on his work without worrying about missing his medical consultation.

Your task is to identify entities(tables), attributes, and all the relevant SQL queries (create, insert into, update and delete) needed to implement the scenario. You have to implement the queries using JDBC.

Question 3: (submit all relevant files)

You are tasked to design a UDP-based chat application facilitating two-way communication between clients and a server. The application should enable clients and the server to send messages to each other and respond accordingly. Messages received by the server and clients should be displayed, with communication continuing until the client inputs 'GoodBye'. The server must support multiple clients simultaneously.

Submission Instructions:

1. First, rename your .java files as i221234_Q1_File1.java, i221234_Q1_File2.java.
2. Submit all the files on GCR, no zips or rar files will be accepted.