RAJALAKSHMI ENGINEERING COLLEGE
(AN AUTONOMOUS INSTITUTE)

A MINI PROJECT BY :

KUMARAN R (230701158)
MANOHARAN K (230701177)

IN PARTIAL FULFILLMENT OF THE AWARD OF THE DEGREE

OF

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

NOVEMBER 2024

RAJALAKSHMI ENGINEERING COLLEGE (AUTONOMOUS)

RAJALAKSHMI NAGAR, THANDALAM – 602 105

BONAFIDE CERTIFICATE

Certified that this project titled **“Hospital Invoice Management System”** is the bonafide work of **Kumaran R (230701158) and Manoharan K (230701177)**, who carried out the project work under our supervision during the year **2024–2025**.

Signature Of Faculty-In-Charge

Submitted for the Practical Examination held on ______________

Internal Examiner External Examiner

Abstract of the Project

The Hospital Invoice Management System is a comprehensive solution designed to streamline and automate the process of patient billing and invoice management in healthcare settings. This system enables efficient tracking and management of patient information, medical treatments, and associated costs.

By leveraging a MySQL database, the system securely stores patient details, billing information, treatment records, and payment history. Key features include patient information management, billing generation, invoice creation, and a clear, itemized summary of charges for each patient.

The system is built using JavaFX for the frontend, providing an intuitive graphical user interface for hospital staff to easily input and manage data. The backend, implemented in Java, handles business logic related to patient registration, billing calculations, and invoice generation. Through a user-friendly interface, hospital personnel can generate and track patient invoices, which include comprehensive breakdowns of charges, treatment details, and payment status.

This project aims to reduce administrative burden, enhance billing accuracy, and improve the overall management of hospital financial transactions, offering both efficiency and transparency in the invoicing process. The system is designed to support healthcare facilities of varying sizes, ensuring scalability, reliability, and ease of use in daily operations.

TABLE OF CONTENTS

INTRODUCTION

1.1 INTRODUCTION

The Hospital Invoice Management System is designed to provide a centralized solution for managing patient billing and invoicing processes in healthcare institutions. This system enables hospital staff to register patients, log in securely, and generate bills tailored to various medical treatments and services. By integrating features such as automated bill calculation and detailed invoice generation, the platform creates an efficient and transparent environment for hospital financial operations. Developed with JavaFX for a user-friendly interface and MySQL for backend data management, the system ensures a robust and secure framework to streamline hospital billing workflows.

1.2 IMPLEMENTATION

The Hospital Invoice Management System is implemented using the concepts of JavaFX for the graphical user interface and MySQL for database management. The backend logic, written in Java, facilitates data processing, including patient registration, billing calculations, and invoice creation.

1.3 SCOPE OF THE PROJECT

The Hospital Invoice Management System offers a structured and efficient platform for hospitals to manage patient billing and invoicing. Its scope includes:
Providing a user-friendly interface for hospital staff to register patients and generate invoices.
Securing sensitive patient and financial data through robust database management.
Offering scalability to accommodate the needs of both small clinics and large hospitals.

Supporting potential future enhancements, such as integrating insurance claims or online payment systems.

1.4 SYSTEM FEATURES

Registration and Login Page: Secure authentication for hospital staff.
Patient Registration Screen: Input and update patient details, including personal information and medical history.
Billing Generation Screen: Automated calculation of treatment costs with itemized summaries.
Invoice Management Screen: View and manage patient invoices with detailed breakdowns.
Database Integration: Securely store and retrieve patient, billing, and invoice data using MySQL.

SYSTEM SPECIFICATIONS

2.1 HARDWARE SPECIFICATIONS:

GRAPHICS	: RTX-3050
PROCESSOR	: Intel i5 (13th GEN)
MEMORY SIZE	: 16 GB

2.2 SOFTWARE SPECIFICATIONS:

PROGRAMMING LANGUAGE	: Java, MySQL
FRONT-END	: Java
BACK-END	: MySQL
OPERATING SYSTEM	: Windows 11

SOURCE CODE

3.1 MAIN APPLICATION :|

```
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import javafx.application.Application;
import javafx.geometry.Insets;
import javafx.geometry.Pos;
import javafx.scene.Scene;
import javafx.scene.control.*;
import javafx.scene.layout.*;
import javafx.scene.paint.Color;
import javafx.scene.paint.CycleMethod;
import javafx.scene.paint.LinearGradient;
import javafx.scene.paint.Stop;
import javafx.stage.Stage;

public class MainApp extends Application {

    public Stage primaryStage;

    @Override
    public void start(Stage primaryStage) {
        this.primaryStage = primaryStage;
        showLoginPage(primaryStage);
    }

    private void showLoginPage(Stage primaryStage) {
        primaryStage.setTitle("Login Page");

        Label userLabel = new Label("Username:");
        TextField userField = new TextField();
        userField.setPromptText("Enter your username");

        Label passLabel = new Label("Password:");
        PasswordField passField = new PasswordField();
        passField.setPromptText("Enter your password");

        Button loginButton = new Button("Login");
        Label messageLabel = new Label("");

        userLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill:
black;");
        passLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill:
black;");
```

```
        loginButton.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
white; -fx-background-color: black;");
        userField.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");
        passField.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");

        loginButton.setOnAction(e -> {
            String username = userField.getText();
            String password = passField.getText();
            if (authenticateUser(username, password)) {
                messageLabel.setText("Login Successful!");
                messageLabel.setTextFill(Color.GREEN);
                showMainWindow(primaryStage);
            } else {
                messageLabel.setText("Invalid username or password.");
                messageLabel.setTextFill(Color.RED);
            }
        });

        VBox vbox = new VBox(10, userLabel, userField, passLabel, passField, loginButton, 
messageLabel);
        vbox.setAlignment(Pos.CENTER);
        vbox.setPadding(new Insets(20));

        Stop[] stops = new Stop[] {
            new Stop(0, Color.CORNFLOWERBLUE),
            new Stop(1, Color.DARKSLATEBLUE)
        };
        LinearGradient gradient = new LinearGradient(0, 0, 1, 1, true, 
CycleMethod.NO_CYCLE, stops);

        BorderPane root = new BorderPane();
        root.setCenter(vbox);
        root.setBackground(new javafx.scene.layout.Background(new 
javafx.scene.layout.BackgroundFill(gradient, javafx.scene.layout.CornerRadii.EMPTY, 
Insets.EMPTY)));

        root.setStyle("-fx-background-image: url('file:/D:/image.jpg');"
                + "-fx-background-size: cover;");

        Scene scene = new Scene(root, 400, 300);
        primaryStage.setScene(scene);
        primaryStage.show();
    }

    private boolean authenticateUser(String username, String password) {
        String query = "SELECT * FROM users WHERE username = ? AND password = ?";
        try (Connection connection = DatabaseConnection.connect();
            PreparedStatement stmt = connection.prepareStatement(query)) {
```

```
            stmt.setString(1, username);
            stmt.setString(2, password);
            ResultSet rs = stmt.executeQuery();
            return rs.next();
        } catch (SQLException e) {
            System.out.println("Error authenticating user: " + e.getMessage());
            return false;
        }
    }

    private void showMainWindow(Stage primaryStage) {
        Button backButton = new Button("Back");
        backButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight: bold;
-fx-text-fill: white; -fx-background-color: #333;");
        backButton.setOnAction(e -> showLoginPage(primaryStage));

        Button patientRegistrationButton = new Button("Patient Registration");
        Button billingButton = new Button("Billing");
        Button invoiceButton = new Button("Invoices");
        Button medicationButton = new Button("Medications");
        Button servicesButton = new Button("Services");
        Button paymentsButton = new Button("Payments");

        patientRegistrationButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px;");
        billingButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px;");
        invoiceButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px;");
        medicationButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px;");
        servicesButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px;");
        paymentsButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px;");

        patientRegistrationButton.setOnAction(e -> openPatientRegistration());
        billingButton.setOnAction(e -> openBilling());
        invoiceButton.setOnAction(e -> openInvoices());
        medicationButton.setOnAction(e -> openMedications());
        servicesButton.setOnAction(e -> openServices());
        paymentsButton.setOnAction(e -> openPayments());

        VBox layout = new VBox(20);
        layout.getChildren().addAll(
                backButton,
                patientRegistrationButton,
                billingButton,
                invoiceButton,
                medicationButton,
                servicesButton,
                paymentsButton
        );
        layout.setAlignment(Pos.CENTER);

        StackPane root = new StackPane();
        BackgroundImage backgroundImage = new BackgroundImage(
                new javafx.scene.image.Image("file:/D:/image.jpg"),
                BackgroundRepeat.NO_REPEAT,
                BackgroundRepeat.NO_REPEAT,
                BackgroundPosition.CENTER,
                BackgroundSize.DEFAULT
        );
        root.setBackground(new Background(backgroundImage));

        root.getChildren().add(layout);

        Scene scene = new Scene(root, 600, 400);
        primaryStage.setTitle("Hospital Management System");
        primaryStage.setScene(scene);
        primaryStage.show();
    }

    private void openPatientRegistration() {
        PatientRegistration registrationWindow = new PatientRegistration();
        Stage registrationStage = new Stage();
        registrationWindow.start(registrationStage);
    }

    private void openBilling() {
        Billing billingWindow = new Billing();
        billingWindow.show();
    }

    private void openInvoices() {
        Invoices invoicesWindow = new Invoices();
        invoicesWindow.show();
    }

    private void openMedications() {
        Medications medicationsWindow = new Medications();
        medicationsWindow.show();
    }

    private void openServices() {
        Services servicesWindow = new Services();
        servicesWindow.show();
    }

    private void openPayments() {
        Payments paymentsWindow = new Payments();
        paymentsWindow.show();
    }

    public static void main(String[] args) {
        launch(args);
    }
}
```

3.2 LOGIN WINDOW DESIGN :

```
import javafx.application.Application;
import javafx.geometry.Insets;
import javafx.geometry.Pos;
import javafx.scene.Scene;
import javafx.scene.control.Button;
import javafx.scene.control.Label;
import javafx.scene.control.PasswordField;
import javafx.scene.control.TextField;
import javafx.scene.layout.BorderPane;
import javafx.scene.layout.VBox;
import javafx.scene.paint.Color;
import javafx.scene.paint.LinearGradient;
import javafx.scene.paint.CycleMethod;
import javafx.scene.paint.Stop;
import javafx.stage.Stage;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;

public class LoginWindow extends Application {

    @Override
    public void start(Stage primaryStage) {
        primaryStage.setTitle("Login Page");

        // Create login form components
        Label userLabel = new Label("Username:");
        TextField userField = new TextField();
        userField.setPromptText("Enter your username");

        Label passLabel = new Label("Password:");
        PasswordField passField = new PasswordField();
        passField.setPromptText("Enter your password");

        Button loginButton = new Button("Login");
        Label messageLabel = new Label("");  // To display login status

        // Styling components
        userLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill:
black;");
        passLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill:
black;");
```

```
        loginButton.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill:
white; -fx-background-color: black;");
        userField.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill:
black;");
        passField.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill:
black;");

        // Action for login button
        loginButton.setOnAction(e -> {
            String username = userField.getText();
            String password = passField.getText();
            if (authenticateUser(username, password)) {
                messageLabel.setText("Login Successful!");
                messageLabel.setTextFill(Color.GREEN);
                openMainWindow(primaryStage);  // Open the main window after successful login
            } else {
                messageLabel.setText("Invalid username or password.");
                messageLabel.setTextFill(Color.RED);
            }
        });

        // Arrange nodes in a VBox layout
        VBox vbox = new VBox(10, userLabel, userField, passLabel, passField, loginButton,
messageLabel);
        vbox.setAlignment(Pos.CENTER);
        vbox.setPadding(new Insets(20));

        // Create a gradient background
        Stop[] stops = new Stop[]{
            new Stop(0, Color.CORNFLOWERBLUE),
            new Stop(1, Color.DARKSLATEBLUE)
        };
        LinearGradient gradient = new LinearGradient(0, 0, 1, 1, true,
CycleMethod.NO_CYCLE, stops);

        // Root pane setup
        BorderPane root = new BorderPane();
        root.setCenter(vbox);
        root.setBackground(new javafx.scene.layout.Background(new
javafx.scene.layout.BackgroundFill(gradient, javafx.scene.layout.CornerRadii.EMPTY,
Insets.EMPTY)));

        // Add background image using CSS style in root node
        root.setStyle("-fx-background-image: url('file:/D:/image.jpg');"
                + "-fx-background-size: cover;");

        Scene scene = new Scene(root, 400, 300);
        primaryStage.setScene(scene);
        primaryStage.show();
    }
```

```
// Authenticate user using the database
private boolean authenticateUser(String username, String password) {
   String query = "SELECT * FROM users WHERE username = ? AND password = ?";
   try (Connection connection = DatabaseConnection.connect();
      PreparedStatement stmt = connection.prepareStatement(query)) {
      stmt.setString(1, username);
      stmt.setString(2, password);
      ResultSet rs = stmt.executeQuery();
      return rs.next();
   } catch (SQLException e) {
      System.out.println("Error authenticating user: " + e.getMessage());
      return false;
   }
}

// Open the main window after successful login
private void openMainWindow(Stage primaryStage) {
   // Create buttons for different sections (Patient Registration, Billing, etc.)
   Button patientRegistrationButton = new Button("Patient Registration");
   Button billingButton = new Button("Billing");
   Button invoiceButton = new Button("Invoices");
   Button medicationButton = new Button("Medications");
   Button servicesButton = new Button("Services");
   Button paymentsButton = new Button("Payments");

   // Event handlers for buttons
   patientRegistrationButton.setOnAction(e -> openPatientRegistration());
   billingButton.setOnAction(e -> openBilling());
   invoiceButton.setOnAction(e -> openInvoices());
   medicationButton.setOnAction(e -> openMedications());
   servicesButton.setOnAction(e -> openServices());
   paymentsButton.setOnAction(e -> openPayments());

   // Layout for the main window
   VBox layout = new VBox(10);
   layout.getChildren().addAll(
         patientRegistrationButton,
         billingButton,
         invoiceButton,
         medicationButton,
         servicesButton,
         paymentsButton
   );

   // Set the scene for the main window
   Scene scene = new Scene(layout, 300, 250);
   primaryStage.setScene(scene);
   primaryStage.show();
}
```

```
    // Methods to handle button clicks for each section
    private void openPatientRegistration() {
        PatientRegistration registration = new PatientRegistration();
        registration.show();
    }

    private void openBilling() {
        Billing billing = new Billing();
        billing.show();
    }

    private void openInvoices() {
        Invoices invoices = new Invoices();
        invoices.show();
    }

    private void openMedications() {
        Medications medications = new Medications();
        medications.show();
    }

    private void openServices() {
        Services services = new Services();
        services.show();
    }

    private void openPayments() {
        Payments payments = new Payments();
        payments.show();
    }

    public static void main(String[] args) {
        launch(args);
    }
}
```

3.3 HOME PAGE DESIGN :

```
import javafx.application.Application;
import javafx.geometry.Pos;
import javafx.scene.Scene;
import javafx.scene.control.Button;
import javafx.scene.image.Image;
import javafx.scene.layout.Background;
import javafx.scene.layout.BackgroundImage;
import javafx.scene.layout.BackgroundPosition;
import javafx.scene.layout.BackgroundRepeat;
import javafx.scene.layout.BackgroundSize;
import javafx.scene.layout.StackPane;
import javafx.scene.layout.VBox;
import javafx.scene.text.Font;
import javafx.stage.Stage;

public class Home extends Application {

    @Override
    public void start(Stage primaryStage) {
        // Call method to open the main window after successful login
        openMainWindow(primaryStage);
    }

    // Method to open the main window with buttons for different sections
    private void openMainWindow(Stage primaryStage) {
        // Create buttons for different sections (Patient Registration, Billing, etc.)
        Button patientRegistrationButton = new Button("Patient Registration");
        Button billingButton = new Button("Billing");
        Button invoiceButton = new Button("Invoices");
        Button medicationButton = new Button("Medications");
        Button servicesButton = new Button("Services");
        Button paymentsButton = new Button("Payments");

        // Set button styles (fonts, size, etc.)
        patientRegistrationButton.setFont(new Font("Arial", 14));
        billingButton.setFont(new Font("Arial", 14));
        invoiceButton.setFont(new Font("Arial", 14));
        medicationButton.setFont(new Font("Arial", 14));
        servicesButton.setFont(new Font("Arial", 14));
        paymentsButton.setFont(new Font("Arial", 14));

        // Event handlers for buttons to open the corresponding sections
        patientRegistrationButton.setOnAction(e -> openPatientRegistration());
        billingButton.setOnAction(e -> openBilling());
        invoiceButton.setOnAction(e -> openInvoices());
        medicationButton.setOnAction(e -> openMedications());
        servicesButton.setOnAction(e -> openServices());
        paymentsButton.setOnAction(e -> openPayments());

        // Layout for the main window with vertical arrangement of buttons
        VBox layout = new VBox(20); // Adjust spacing between buttons
        layout.getChildren().addAll(
                patientRegistrationButton,
                billingButton,
                invoiceButton,
                medicationButton,
                servicesButton,
                paymentsButton
        );
        layout.setAlignment(Pos.CENTER); // Center-align buttons
        // Set background image
        StackPane root = new StackPane();
        BackgroundImage backgroundImage = new BackgroundImage(
                new Image("file:/D:/image.jpg"),  // Replace with your image path
                BackgroundRepeat.NO_REPEAT,
                BackgroundRepeat.NO_REPEAT,
                BackgroundPosition.CENTER,
                BackgroundSize.DEFAULT
        );
        root.setBackground(new Background(backgroundImage));
        // Add layout to the root pane
        root.getChildren().add(layout);

        // Set the scene for the main window
        Scene scene = new Scene(root, 600, 400);  // Increase window size for better visibility
        primaryStage.setTitle("Hospital Management System");
        primaryStage.setScene(scene);
        primaryStage.show();
    }
    // Methods to handle button clicks for each section
    private void openPatientRegistration() {
        // Logic to open the Patient Registration page
        System.out.println("Patient Registration Page Opened");
    }

    private void openBilling() {
        // Logic to open the Billing page
        System.out.println("Billing Page Opened");
    }

    private void openInvoices() {
        // Logic to open the Invoices page
        System.out.println("Invoices Page Opened");
    }

    private void openMedications() {
        // Logic to open the Medications page
        System.out.println("Medications Page Opened");
    }

    private void openServices() {
        // Logic to open the Services page
        System.out.println("Services Page Opened");
    }

    private void openPayments() {
        // Logic to open the Payments page
        System.out.println("Payments Page Opened");
    }
```

```
    public static void main(String[] args) {
        launch(args);
    }
}
```

3.4 PATIENT REGISTRATION PAGE DESIGN

```
import javafx.application.Application;
import javafx.geometry.Insets;
import javafx.geometry.Pos;
import javafx.scene.Scene;
import javafx.scene.control.*;
import javafx.scene.layout.GridPane;
import javafx.stage.Stage;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.SQLException;

public class PatientRegistration extends Application {

    @Override
    public void start(Stage primaryStage) {
        primaryStage.setTitle("Patient Registration");

        // Create the root layout (GridPane)
        GridPane grid = new GridPane();
        grid.setAlignment(Pos.CENTER);
        grid.setHgap(10);
        grid.setVgap(10);
        grid.setPadding(new Insets(25, 25, 25, 25));

        // Set the background image
        grid.setStyle("-fx-background-image: url(file:/D:/image.jpg);"
                + "-fx-background-size: cover; -fx-background-position: center;");

        // Create and add form fields for patient registration
        Label nameLabel = new Label("Patient Name:");
        nameLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");
        grid.add(nameLabel, 0, 0);

        TextField nameField = new TextField();
        nameField.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");
        grid.add(nameField, 1, 0);

        Label ageLabel = new Label("Age:");
        ageLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");
```

```
        grid.add(ageLabel, 0, 1);

        TextField ageField = new TextField();
        ageField.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: black;");
        grid.add(ageField, 1, 1);

        Label genderLabel = new Label("Gender:");
        genderLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");
        grid.add(genderLabel, 0, 2);

        ComboBox<String> genderComboBox = new ComboBox<>();
        genderComboBox.getItems().addAll("Male", "Female", "Other");
        genderComboBox.setValue("Male");  // Default value
        genderComboBox.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-
fill: black;");
        grid.add(genderComboBox, 1, 2);

        Label contactLabel = new Label("Contact Number:");
        contactLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");
        grid.add(contactLabel, 0, 3);

        TextField contactField = new TextField();
        contactField.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");
        grid.add(contactField, 1, 3);

        // Create an address field
        Label addressLabel = new Label("Address:");
        addressLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");
        grid.add(addressLabel, 0, 4);

        TextField addressField = new TextField();
        addressField.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
black;");
        grid.add(addressField, 1, 4);

        // Create a medical history field
        Label medicalHistoryLabel = new Label("Medical History:");
        medicalHistoryLabel.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-
fill: black;");
        grid.add(medicalHistoryLabel, 0, 5);

        TextField medicalHistoryField = new TextField();
        medicalHistoryField.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-
fill: black;");
        grid.add(medicalHistoryField, 1, 5);
        // Register button setup
        Button registerButton = new Button("Register");
        registerButton.setStyle("-fx-font-family: 'Roboto'; -fx-font-weight: bold; -fx-text-fill: 
white; -fx-background-color: black;");
        grid.add(registerButton, 1, 6);

        // Set action for Register button
        registerButton.setOnAction(e -> {
            String name = nameField.getText();
            int age = Integer.parseInt(ageField.getText());
            String gender = genderComboBox.getValue();
            String contactInfo = contactField.getText();
            String address = addressField.getText();
            String medicalHistory = medicalHistoryField.getText();

            // Insert the patient into the database
            String query = "INSERT INTO patients (name, age, gender, contact_info, address, 
medical_history) VALUES (?, ?, ?, ?, ?, ?)";
            try (Connection connection = DatabaseConnection.connect();
                PreparedStatement stmt = connection.prepareStatement(query)) {

                stmt.setString(1, name);
                stmt.setInt(2, age);
                stmt.setString(3, gender);
                stmt.setString(4, contactInfo);
                stmt.setString(5, address);
                stmt.setString(6, medicalHistory);

                int rowsAffected = stmt.executeUpdate();
                System.out.println(rowsAffected + " patient(s) added.");

                Alert alert = new Alert(Alert.AlertType.INFORMATION);
                alert.setTitle("Registration Successful");
                alert.setHeaderText("Patient Registered Successfully");
                alert.setContentText("The patient has been added to the system.");
                alert.showAndWait();

                // Clear the fields after registration
                nameField.clear();
                ageField.clear();
                contactField.clear();
                addressField.clear();
                medicalHistoryField.clear();

            } catch (SQLException ex) {
                System.out.println("Error inserting patient: " + ex.getMessage());
                Alert alert = new Alert(Alert.AlertType.ERROR);
                alert.setTitle("Error");
                alert.setHeaderText("Patient Registration Failed");
                alert.setContentText("There was an error while registering the patient.");
                alert.showAndWait();
            }
        });

        // Create the scene and display it
        Scene scene = new Scene(grid, 400, 400);
        primaryStage.setScene(scene);
        primaryStage.show();
    }

    public static void main(String[] args) {
        launch(args);
    }

    public void show() {
        throw new UnsupportedOperationException("Unimplemented method 'show'");
    }
}
```

3.5 MEDICATIONS PAGE DESIGN

```
import javafx.scene.Scene;
import javafx.scene.control.TextField;
import javafx.scene.control.Button;
import javafx.scene.layout.VBox;
import javafx.stage.Stage;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import javafx.scene.control.Alert;
import javafx.scene.control.Alert.AlertType;

public class Medications extends Stage {

    public Medications() {
        setTitle("Medications");

        // Create TextFields with CSS styles
        TextField patientIDField = new TextField();
        patientIDField.setPromptText("Enter Patient ID");
        patientIDField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight:
bold; -fx-text-fill: black;");

        TextField medicationField = new TextField();
        medicationField.setPromptText("Enter Medication");
        medicationField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight:
bold; -fx-text-fill: black;");

        TextField dosageField = new TextField();
        dosageField.setPromptText("Enter Dosage");
        dosageField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight: bold;
-fx-text-fill: black;");

        // Create Save Button with style
        Button saveButton = new Button("Save Medication");
        saveButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 16px; -fx-font-weight: bold; -
fx-text-fill: white; -fx-background-color: black;");

        // Set the save action
        saveButton.setOnAction(e -> {
            String patientID = patientIDField.getText();
            String medication = medicationField.getText();
            String dosage = dosageField.getText();

            // Input validation
            if (patientID.isEmpty() || medication.isEmpty() || dosage.isEmpty()) {
                showAlert(AlertType.ERROR, "Validation Error", "Please fill out all fields.");
                return;
            }

            // Save medication to the database
            saveMedicationToDatabase(patientID, medication, dosage);
            showAlert(AlertType.INFORMATION, "Success", "Medication saved successfully.");

            // Clear fields after saving
            patientIDField.clear();
            medicationField.clear();
            dosageField.clear();
        });

        // Layout for the medications form
        VBox layout = new VBox(10);
        layout.getChildren().addAll(patientIDField, medicationField, dosageField, saveButton);

        // Set background image with CSS style
        layout.setStyle("-fx-background-image: url('file:/D:/image.jpg');"
                + "-fx-background-size: cover;");

        // Set the scene and window properties
        Scene scene = new Scene(layout, 400, 300);
        setScene(scene);
    }

    // Database connection details
    private Connection connectToDatabase() throws SQLException {
        String url = "jdbc:mysql://localhost:3306/hospital_management";
        String user = "root";  // replace with your MySQL username
        String password = "kumaran";  // replace with your MySQL password
        return DriverManager.getConnection(url, user, password);
    }

    // Save medication information to the database
    private void saveMedicationToDatabase(String patientID, String medication, String
dosage) {
        String sql = "INSERT INTO medications (patient_id, medication, dosage) VALUES (?,
?, ?)";

        try (Connection conn = connectToDatabase();
            PreparedStatement pstmt = conn.prepareStatement(sql)) {

            pstmt.setString(1, patientID);
            pstmt.setString(2, medication);
            pstmt.setString(3, dosage);
            pstmt.executeUpdate();
        } catch (SQLException e) {
            showAlert(AlertType.ERROR, "Database Error", "Failed to save medication: " +
e.getMessage());
        }
    }

    // Show alert helper method
    private void showAlert(AlertType alertType, String title, String message) {
        Alert alert = new Alert(alertType);
        alert.setTitle(title);
        alert.setHeaderText(null);
        alert.setContentText(message);
        alert.showAndWait();
    }
}
```

3.6 SERVICES PAGE DESIGN

```
import javafx.application.Application;
import javafx.scene.Scene;
import javafx.scene.control.TextField;
import javafx.scene.control.Button;
import javafx.scene.layout.VBox;
import javafx.stage.Stage;
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import javafx.scene.control.Alert;

public class Services extends Application {

    @Override
    public void start(Stage primaryStage) {
        primaryStage.setTitle("Services");
        // Create TextFields with styling
        TextField serviceNameField = new TextField();
        serviceNameField.setPromptText("Enter Service Name");
        serviceNameField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight:
bold; -fx-text-fill: black;");

        TextField descriptionField = new TextField();
        descriptionField.setPromptText("Enter Description");
        descriptionField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight:
bold; -fx-text-fill: black;");

        // Cr`eate Save Button with styling
        Button saveButton = new Button("Save Service");
        saveButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 16px; -fx-font-weight: bold; -
fx-text-fill: white; -fx-background-color: black;");

        // Layout for the Services form
        VBox layout = new VBox(10);
        layout.getChildren().addAll(serviceNameField, descriptionField, saveButton);

        // Set background image and additional styles
        layout.setStyle("-fx-background-image: url('file:/D:/image.jpg');"
                + "-fx-background-size: cover;");

        // Set the scene and window properties
        Scene scene = new Scene(layout, 400, 300);
        primaryStage.setScene(scene);
        primaryStage.show();

        // Set action for Save Service button
        saveButton.setOnAction(e -> {
            String serviceName = serviceNameField.getText();
            String description = descriptionField.getText();

            // Insert the service into the database
            String query = "INSERT INTO services (service_name, description) VALUES (?, ?)";
            try (Connection connection = DatabaseConnection.connect();
                PreparedStatement stmt = connection.prepareStatement(query)) {

                stmt.setString(1, serviceName);
                stmt.setString(2, description);

                int rowsAffected = stmt.executeUpdate();
                System.out.println(rowsAffected + " service(s) added.");

                // Display success message
                Alert alert = new Alert(Alert.AlertType.INFORMATION);
                alert.setTitle("Service Registration");
                alert.setHeaderText("Service Saved Successfully");
                alert.setContentText("The service has been added to the system.");
                alert.showAndWait();

                // Clear fields after saving
                serviceNameField.clear();
                descriptionField.clear();

            } catch (SQLException ex) {
                System.out.println("Error inserting service: " + ex.getMessage());
                Alert alert = new Alert(Alert.AlertType.ERROR);
                alert.setTitle("Error");
                alert.setHeaderText("Service Registration Failed");
                alert.setContentText("There was an error while saving the service.");
                alert.showAndWait();
            }
        });
    }

    public static void main(String[] args) {
        launch(args);
    }

    // Database connection class
    public static class DatabaseConnection {
        public static Connection connect() throws SQLException {
            // Replace with your MySQL connection details
            String url = "jdbc:mysql://localhost:3306/your_database";
            String username = "root";
            String password = "kumaran";

            return java.sql.DriverManager.getConnection(url, username, password);
        }
    }

    public void show() {
        throw new UnsupportedOperationException("Unimplemented method 'show'");
    }
}
```

3.7 BILLING PAGE DESIGN

```
import javafx.scene.Scene;
import javafx.scene.control.TextField;
import javafx.scene.control.Button;
import javafx.scene.layout.VBox;
import javafx.stage.Stage;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import javafx.scene.control.Alert;
import javafx.scene.control.Alert.AlertType;

public class Billing {

    public Billing() {
        Stage billingStage = new Stage();  // Create a new Stage instance for the Billing window
        billingStage.setTitle("Billing");

        // Create TextFields
        TextField patientIDField = new TextField();
        patientIDField.setPromptText("Enter Patient ID");
        patientIDField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight:
bold; -fx-text-fill: black;");

        TextField serviceField = new TextField();
        serviceField.setPromptText("Enter Service");
        serviceField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight: bold;
-fx-text-fill: black;");

        TextField amountField = new TextField();
        amountField.setPromptText("Enter Amount");
        amountField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight: bold;
-fx-text-fill: black;");

        // Create a Save Button
        Button saveButton = new Button("Save Billing");
        saveButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 16px; -fx-font-weight: bold; -
fx-text-fill: white; -fx-background-color: black;");

        // Set the save action
        saveButton.setOnAction(e -> {
            String patientID = patientIDField.getText();
            String service = serviceField.getText();
            String amountText = amountField.getText();

            // Input validation
            if (patientID.isEmpty() || service.isEmpty() || amountText.isEmpty()) {
                showAlert(AlertType.ERROR, "Validation Error", "Please fill out all fields.");
                return;
            }

            try {
                double amount = Double.parseDouble(amountText);
                saveBillingToDatabase(patientID, service, amount);
                showAlert(AlertType.INFORMATION, "Success", "Billing information saved
successfully.");

                // Clear fields after saving
                patientIDField.clear();
                serviceField.clear();
                amountField.clear();
            } catch (NumberFormatException ex) {
                showAlert(AlertType.ERROR, "Invalid Input", "Amount must be a valid
number.");
            }
        });

        // Layout for the billing form
        VBox layout = new VBox(10);
        layout.getChildren().addAll(patientIDField, serviceField, amountField, saveButton);

        // Set background image with CSS
        layout.setStyle("-fx-background-image: url('file:/D:/image.jpg');"
                + "-fx-background-size: cover;");

        // Set the scene and window properties
        Scene scene = new Scene(layout, 400, 300);
        billingStage.setScene(scene);
        billingStage.show(); // Show the Billing window
    }

    // Database connection details
    private Connection connectToDatabase() throws SQLException {
        String url = "jdbc:mysql://localhost:3306/hospital_management";
        String user = "root";  // replace with your MySQL username
        String password = "kumaran";  // replace with your MySQL password
        return DriverManager.getConnection(url, user, password);
    }

    // Save billing information to database
    private void saveBillingToDatabase(String patientID, String service, double amount) {
        String sql = "INSERT INTO billing (patient_id, service, amount) VALUES (?, ?, ?)";

        try (Connection conn = connectToDatabase();
            PreparedStatement pstmt = conn.prepareStatement(sql)) {

            pstmt.setString(1, patientID);
            pstmt.setString(2, service);
            pstmt.setDouble(3, amount);
            pstmt.executeUpdate();
        } catch (SQLException e) {
            showAlert(AlertType.ERROR, "Database Error", "Failed to save billing information:
" + e.getMessage());
        }
    }

    // Show alert helper method
    private void showAlert(AlertType alertType, String title, String message) {
        Alert alert = new Alert(alertType);
        alert.setTitle(title);
        alert.setHeaderText(null);
        alert.setContentText(message);
        alert.showAndWait();
    }

    public void show() {
        // Assuming this method is supposed to show the billing window
    }
}
```

3.8 PAYMENTS PAGE DESIGN

```
import javafx.scene.Scene;
import javafx.scene.control.Alert;
import javafx.scene.control.Button;
import javafx.scene.control.TextField;
import javafx.scene.layout.VBox;
import javafx.stage.Stage;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.SQLException;

public class Payments extends Stage {

    public Payments() {
        setTitle("Payments");

        // Create TextFields with styling
        TextField billingIDField = new TextField();
        billingIDField.setPromptText("Enter Billing ID");
        billingIDField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight:
bold; -fx-text-fill: black;");

        TextField amountField = new TextField();
        amountField.setPromptText("Enter Payment Amount");
        amountField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight: bold;
-fx-text-fill: black;");

        TextField dateField = new TextField();
        dateField.setPromptText("Enter Payment Date");
        dateField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight: bold; -
fx-text-fill: black;");

        // Create Save Button with styling
        Button saveButton = new Button("Save Payment");
        saveButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 16px; -fx-font-weight: bold; -
fx-text-fill: white; -fx-background-color: black;");

        // Action for Save Button
        saveButton.setOnAction(e -> savePayment(billingIDField.getText(),
amountField.getText(), dateField.getText()));

        // Layout for the payment form
        VBox layout = new VBox(10);
        layout.getChildren().addAll(billingIDField, amountField, dateField, saveButton);

        // Set background image and styling
        layout.setStyle("-fx-background-image: url('file:/D:/image.jpg');"
                + "-fx-background-size: cover;");

        // Set the scene and window properties
        Scene scene = new Scene(layout, 400, 300);
        setScene(scene);
    }

    // Method to save payment information to the database
    private void savePayment(String billingID, String amount, String date) {
        // SQL query to insert payment details
        String query = "INSERT INTO payments (billing_id, amount, payment_date) VALUES
(?, ?, ?)";

        // Connect to the database and execute the query
        try (Connection connection = DatabaseConnection.connect();
            PreparedStatement statement = connection.prepareStatement(query)) {

            statement.setString(1, billingID);
            statement.setString(2, amount);
            statement.setString(3, date);

            int rowsAffected = statement.executeUpdate();
            if (rowsAffected > 0) {
                showAlert(Alert.AlertType.INFORMATION, "Success", "Payment saved
successfully.");
            }

        } catch (SQLException e) {
            showAlert(Alert.AlertType.ERROR, "Error", "Failed to save payment: " +
e.getMessage());
        }
    }

    // Helper method to display alerts
    private void showAlert(Alert.AlertType alertType, String title, String message) {
        Alert alert = new Alert(alertType);
        alert.setTitle(title);
        alert.setContentText(message);
        alert.showAndWait();
    }
}
```

3.9 INVOICE PAGE DESIGN

```
import javafx.scene.Scene;
import javafx.scene.control.TextField;
import javafx.scene.control.Button;
import javafx.scene.layout.VBox;
import javafx.stage.Stage;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import javafx.scene.control.Alert;
import javafx.scene.control.Alert.AlertType;

public class Invoices extends Stage {

    public Invoices() {
        setTitle("Invoices");

        // Create TextFields with CSS styles
        TextField billingIDField = new TextField();
        billingIDField.setPromptText("Enter Billing ID");
        billingIDField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight:
bold; -fx-text-fill: black;");

        TextField dateField = new TextField();
        dateField.setPromptText("Enter Date (YYYY-MM-DD)");
        dateField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight: bold; -
fx-text-fill: black;");

        TextField totalField = new TextField();
        totalField.setPromptText("Enter Total");
        totalField.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 14px; -fx-font-weight: bold; -
fx-text-fill: black;");

        // Create Save Button with style
        Button saveButton = new Button("Save Invoice");
        saveButton.setStyle("-fx-font-family: 'Arial'; -fx-font-size: 16px; -fx-font-weight: bold; -
fx-text-fill: white; -fx-background-color: black;");

        // Set the save action
        saveButton.setOnAction(e -> {
            String billingID = billingIDField.getText();
            String date = dateField.getText();
            String totalText = totalField.getText();

            // Input validation
            if (billingID.isEmpty() || date.isEmpty() || totalText.isEmpty()) {
```

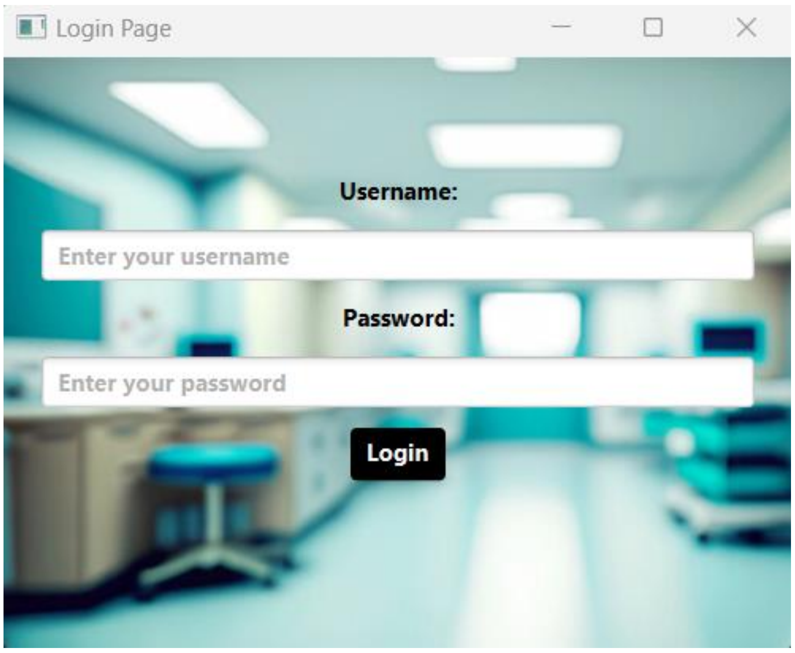
```
            showAlert(AlertType.ERROR, "Validation Error", "Please fill out all fields.");
            return;
        }

        try {
            double total = Double.parseDouble(totalText);
            saveInvoiceToDatabase(billingID, date, total);
            showAlert(AlertType.INFORMATION, "Success", "Invoice saved successfully.");

            // Clear fields after saving
            billingIDField.clear();
            dateField.clear();
            totalField.clear();
        } catch (NumberFormatException ex) {
            showAlert(AlertType.ERROR, "Invalid Input", "Total must be a valid number.");
        }
    });

    // Layout for the invoice form
    VBox layout = new VBox(10);
    layout.getChildren().addAll(billingIDField, dateField, totalField, saveButton);

    // Set background image with CSS style
    layout.setStyle("-fx-background-image: url('file:/D:/image.jpg');"
            + "-fx-background-size: cover;");

    // Set the scene and window properties
    Scene scene = new Scene(layout, 400, 300);
    setScene(scene);
}

// Database connection details
private Connection connectToDatabase() throws SQLException {
    String url = "jdbc:mysql://localhost:3306/hospital_management";
    String user = "root";  // replace with your MySQL username
    String password = "kumaran";  // replace with your MySQL password
    return DriverManager.getConnection(url, user, password);
}

// Save invoice information to the database
private void saveInvoiceToDatabase(String billingID, String date, double total) {
    String sql = "INSERT INTO invoices (billing_id, date, total) VALUES (?, ?, ?)";

    try (Connection conn = connectToDatabase();
        PreparedStatement pstmt = conn.prepareStatement(sql)) {

        pstmt.setString(1, billingID);
        pstmt.setString(2, date);
        pstmt.setDouble(3, total);
        pstmt.executeUpdate();
        } catch (SQLException e) {
            showAlert(AlertType.ERROR, "Database Error", "Failed to save invoice: " +
e.getMessage());
        }
    }

    // Show alert helper method
    private void showAlert(AlertType alertType, String title, String message) {
        Alert alert = new Alert(alertType);
        alert.setTitle(title);
        alert.setHeaderText(null);
        alert.setContentText(message);
        alert.showAndWait();
    }
}
```

3.10 DATABASE CONNECTIVITY

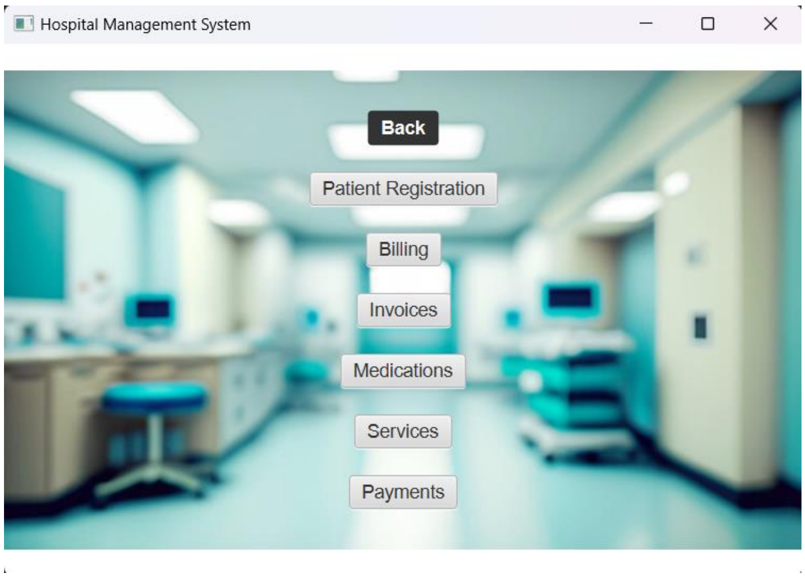
```
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;

public class DatabaseConnection {
    private static final String URL = "jdbc:mysql://localhost:3306/hospital_management";
    private static final String USER = "root";
    private static final String PASSWORD = "kumaran";

    public static Connection connect() {
        try {
            return DriverManager.getConnection(URL, USER, PASSWORD);
        } catch (SQLException e) {
            System.out.println("Database connection error: " + e.getMessage());
            return null;
        }
    }
}
```

SNAPSHOTS

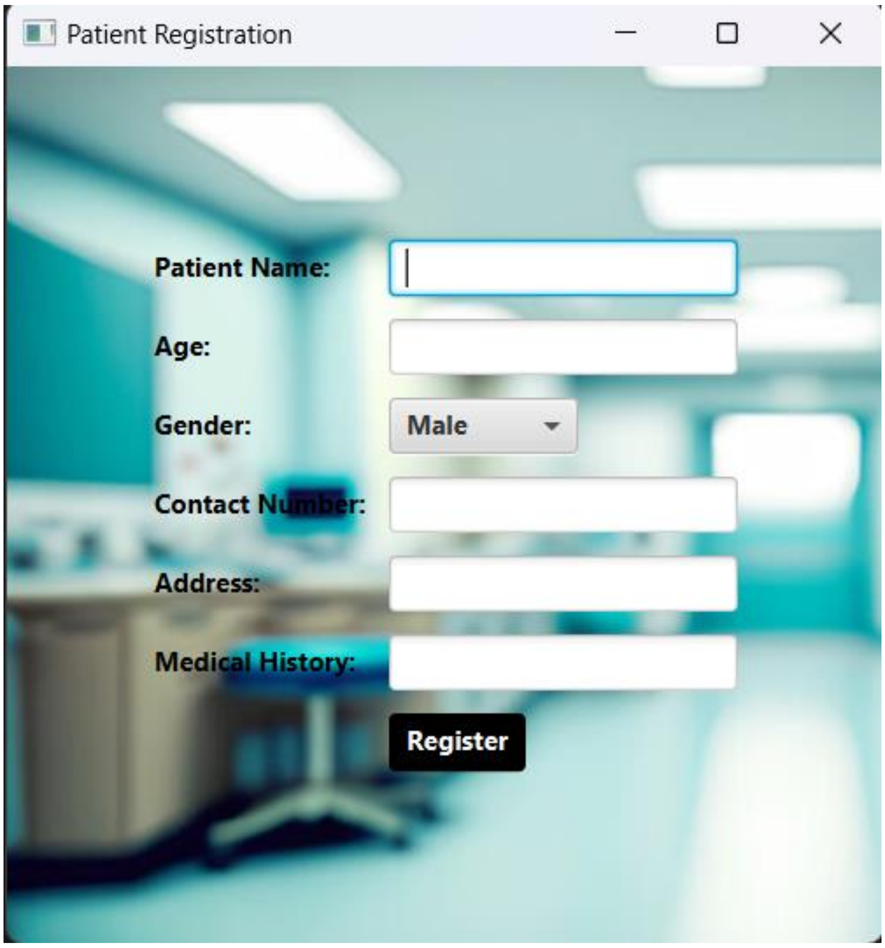
4.1 LOGIN PAGE:



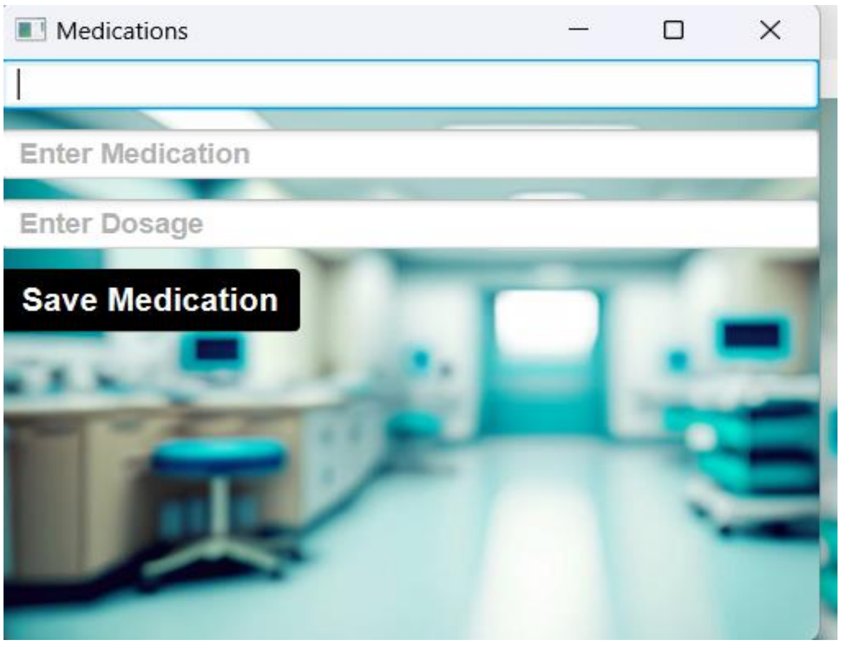
4.2 HOME PAGE:



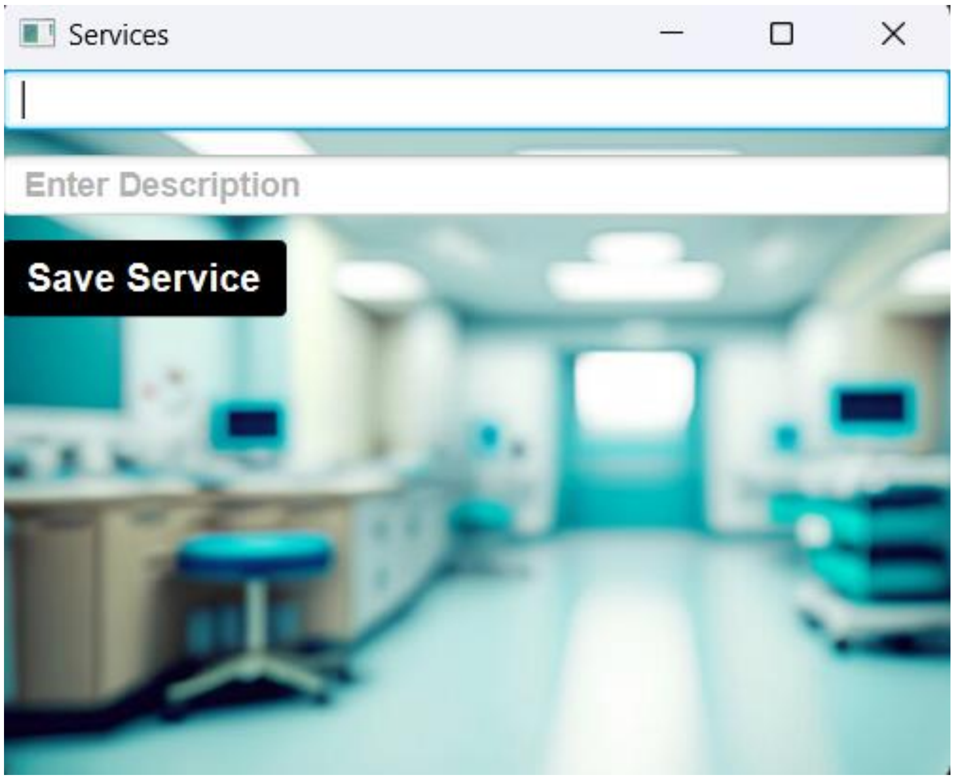
4.3 PATIENT REGISTRATION PAGE:



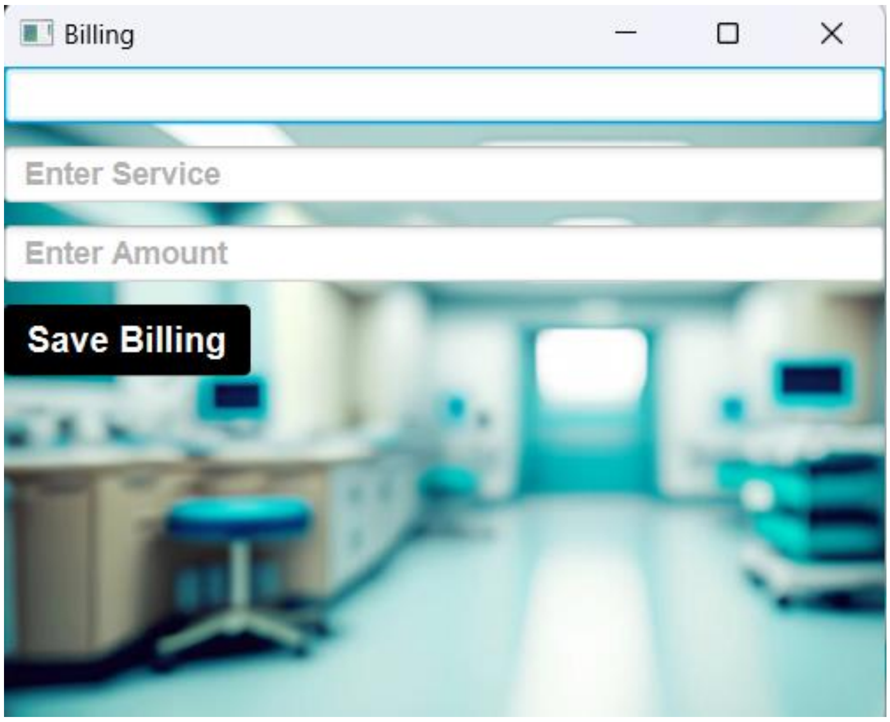
4.4 MEDICATIONS PAGE:



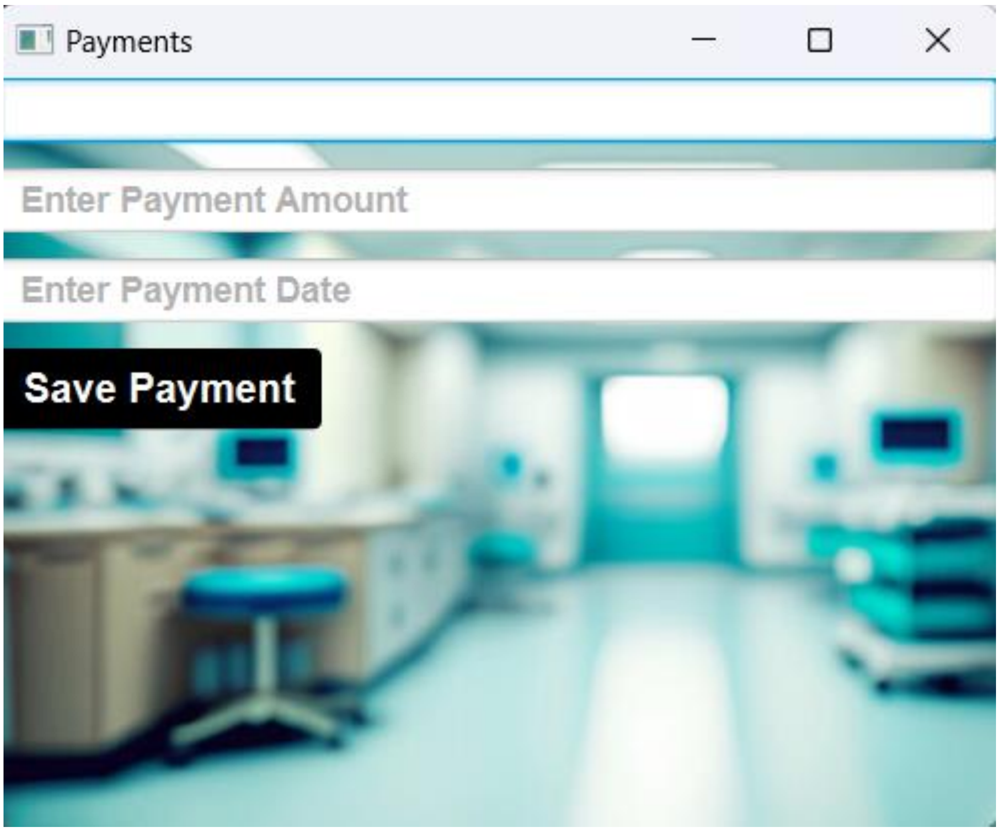
4.5 SERVICES PAGE:



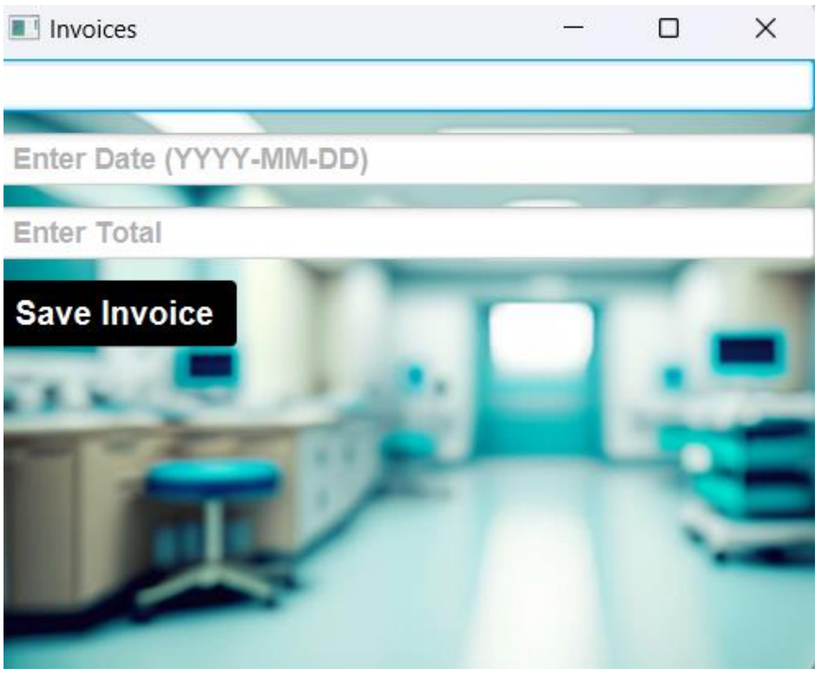
4.6 BILLING PAGE:



4.7 PAYMENTS PAGE:



4.8 INVOICE PAGE:



CONCLUSION:

The **Hospital Management System (HMS)** project was successfully completed, integrating key functionalities like billing, payments, and service management. Developed using **JavaFX** for the user interface and **MySQL** for data management, the system ensures efficient, secure, and user-friendly operations.

The project effectively streamlines hospital processes, supports data integrity, and offers scalability for future enhancements such as appointment scheduling or role-based access. Overall, this system is a robust solution for improving operational efficiency in healthcare management.

REFERENCES:

1. https://openjfx.io
2. https://dev.mysql.com/doc/
3. https://docs.oracle.com/javase/tutorial/jdbc/
4. https://www.w3schools.com/sql/
5. https://stackoverflow.com/