**Skylines Hospital Management System**

**Project Report**



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**Skylines Hospital Management System**

# Introduction:

The **Skylines Hospital Management System** is a desktop-based application developed using **C# Windows Forms** for the front-end and **SQL Server Management Studio (SSMS)** for database management. The system streamlines hospital operations by managing rooms, departments, patients, doctors, nurses, and appointments efficiently.

# Objectives:

* Automate hospital administrative tasks.
* Efficiently manage patient and staff data.
* Provide a secure and reliable platform for hospital management.

# System Features and Roles:

## **Doctor:**

* **Manage Schedule**: Doctors can manage their schedules.
* **Manage Appointments**: Handles patient appointment bookings.
* **Manage Prescriptions**: Doctors can generate and store prescriptions.

## **Admin:**

* **Add Room**: Admins can add new rooms to the system.
* **Add Department**: Admins can create and manage hospital departments.
* **Add Doctor**: Admins can add new doctors.
* **Add Nurse**: Admins can add nurses.
* **Add Patient**: Admins can register new patients.
* **Manage Users**: Admins can add and manage system users.
* **Login**: Provides authentication for users.

## **Patient:**

* **Apply Room**: Patients can apply for room allocation.
* **View Allotted Rooms**: Patients can check assigned rooms.

# Technologies Used:

* **Front-end**: C# Windows Forms
* **Back-end**: SQL Server Management Studio (SSMS)
* **IDE**: Visual Studio

# System Workflow:

## **User Authentication:**

Users log in based on their roles.

## **Role Specific Functionalities:**

* Admins manage doctors, nurses, and departments.
* Patients apply for rooms and view assigned rooms.
* Doctors manage schedules, appointments, and prescriptions.

## **Database Integration:**

All data is stored and retrieved from SSMS.

## **Data Security Measures:**

Access control implemented based on user roles

# Implementation Details:

* Forms are created for user-friendly interaction.
* SQL queries handle CRUD operations for data management.
* Exception handling ensures system reliability.
* **Triggers**: Implemented in the database to maintain data integrity. For example:
  + **Before Insert Triggers** ensure that duplicate patient records are not created.
  + **After Update Triggers** log changes made to patient and doctor records for auditing purposes.

# Log Tables:

To enhance security and tracking, log tables are used to maintain a record of critical operations:

* **User Activity Log**: Stores login/logout attempts and actions performed by users.
* **Database Change Log**: Records modifications to patient details, appointments, and prescriptions.
* **Error Log**: Captures system errors and exceptions for debugging.

# Challenges and Solutions:

* **Database Connectivity Issues**: Solved using ADO.NET with proper connection strings.
* **User Authentication**: Implemented secure login with role-based access.
* **Data Consistency**: Ensured through normalized database design.
* **Audit & Security**: Implemented log tables and triggers to monitor and secure data changes.

# Conclusion:

The **Skylines Hospital Management System** successfully streamlines hospital operations, making management more efficient and reducing manual errors. With role-based access, structured data storage, and user-friendly interfaces, the system significantly enhances hospital workflow.

# Future Enhancements:

* Implement a web-based version.
* Integrate real-time notifications.
* Add reporting and analytics features.
* Enhance security with additional logging mechanisms.
* Improve database triggers for automated data validation.