جامعة الإمام عبدالرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY
كلية العلوم والدراسات الإنسانية - قسم علوم الحاسب الآلي
Collage of Science and Humanities - Computer Science Department

HOSPITAL MANAGEMENT SYSTEM

By:
Norah Alshreef (5) |2230003838
Batool Alsharqi (2) | 2230000960
Ghala Alshehri (5) | 2230007013
Jood Alzayer (5) | 2230002118
Zainab Esaeed (5) | 2230000664
Remas Alqahtani (3) | 2230002912
Lama Alfawaz (3) |2230004462

Group 20

CS321-OBJECT ORIENTED PROROGRAMING(2)

COMPUTER SCIENCE

2024-2025

Table of Contents

Introduction 3

Objective 4

Database design.....5

Program implementation and interface design 6

Program implementation and interface design 7

Program implementation and interface design 8

Technologies used,Challenges faced during te development..

.....9

Conclusion 10

Introduction:

Our project focuses on the development of a comprehensive Hospital Management System using Java. The primary goal of this system is to streamline the operations within a hospital setting by modeling and facilitating the interactions between various user roles, including Patients, Doctors, and Receptionists. The system is designed to efficiently manage essential hospital functions such as appointment scheduling, patient medical records, doctor availability, and payment processing. By digitizing and centralizing these processes, the system significantly enhances operational efficiency, improves data accuracy, and strengthens communication across departments.

A key feature of our project is the implementation of dedicated user interfaces tailored to each user group:

- Patient Interface: Allows patients to book appointments, and manage their medical records easily and directly.

- Doctor Interface: Provides doctors with quick access to patient information, the ability to update records.

- Receptionist Interface: Enables reception staff to manage appointments, and organize patient check-ins effectively.

The project is distinguished by its connection to a database, where all medical and administrative information is stored. This system ensures data integration and easy access. Overall, our Hospital Management System aims to modernize hospital workflows, reduce manual effort, and support healthcare professionals in delivering high-quality care.

Objective:

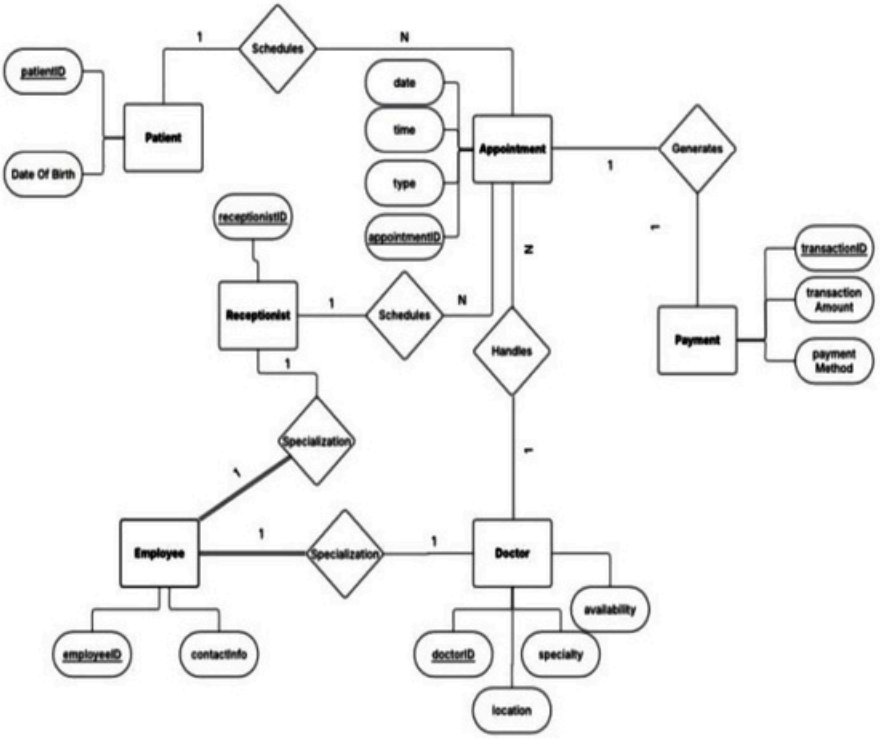
- **Design and Implementation of Graphical User Interfaces (GUI) for System Modules:**

As part of the Hospital Management System project, we undertook the design and development of intuitive and user-friendly Graphical User Interfaces (GUIs) tailored for each functional module of the system. These modules include Receptionist, Patient, Appointment, Doctor, Employee, and Payment. Each interface was carefully structured to align with the specific needs and tasks associated with the corresponding user role. For example, the Receptionist module allows staff to schedule and manage appointments, while the Doctor module provides access to patient histories and facilitates record updates. The Patient interface supports appointment booking and medical record viewing, ensuring a user-centric experience. By leveraging Java Swing for GUI development, we focused on creating a consistent visual design, responsive layouts, and seamless navigation across all modules, thereby enhancing usability and workflow efficiency within the hospital environment.

- **Development and Integration of a Real-Time Database Connection:**

A critical component of the system's architecture involved the creation and implementation of a robust database connection to ensure real-time data access and synchronization across all modules. Using JDBC (Java Database Connectivity), we established secure and efficient communication between the Java-based application and the underlying relational database. This allowed for dynamic data storage, retrieval, and modification in real-time, ensuring that information such as appointment schedules, patient records, doctor availability, employee details, and payment transactions remained consistently up-to-date. The database integration plays a vital role in maintaining data integrity, supporting concurrent access, and enabling centralized data management—ultimately contributing to a more reliable and scalable hospital management solution.

Database design:



Program implementation and interface design:

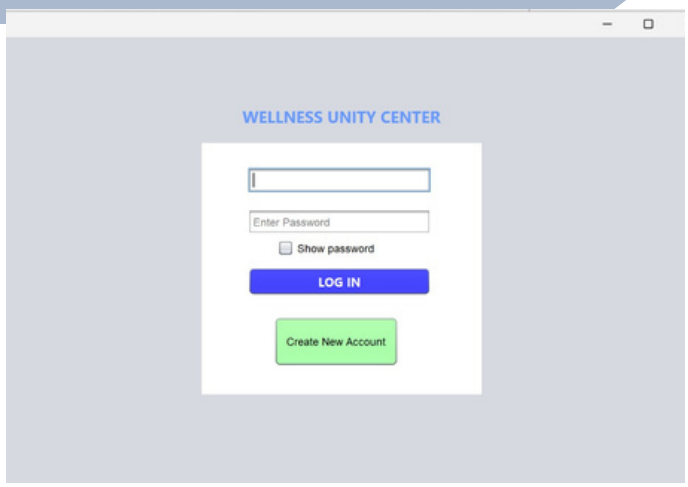


Fig.1

This is the homepage of the Wellness Unity Center, where users can log in to their existing accounts or create a new account to access the system.

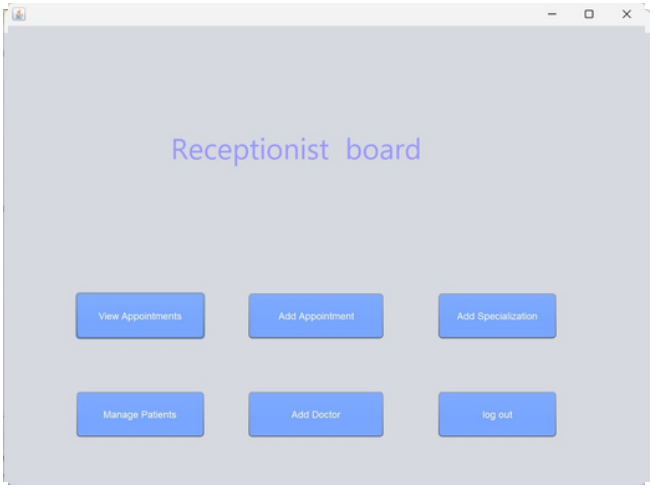


Fig.2

This interface allows users to create a new account , if they do not have an account

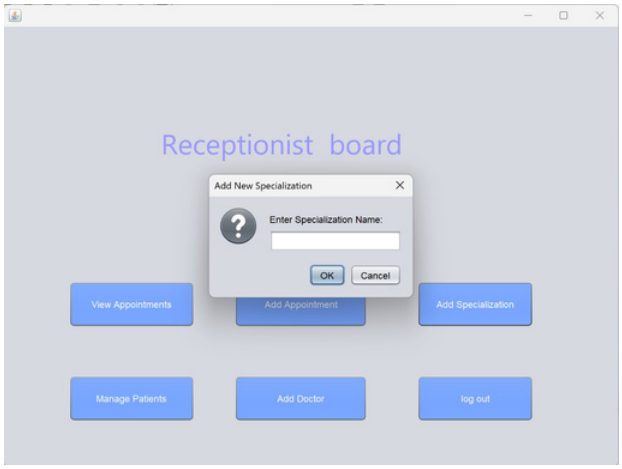


Fig.4

This is the receptionist dashboard, where the receptionist can view view,add appointments, add specialization, mangae patients,add doctor,and log out .

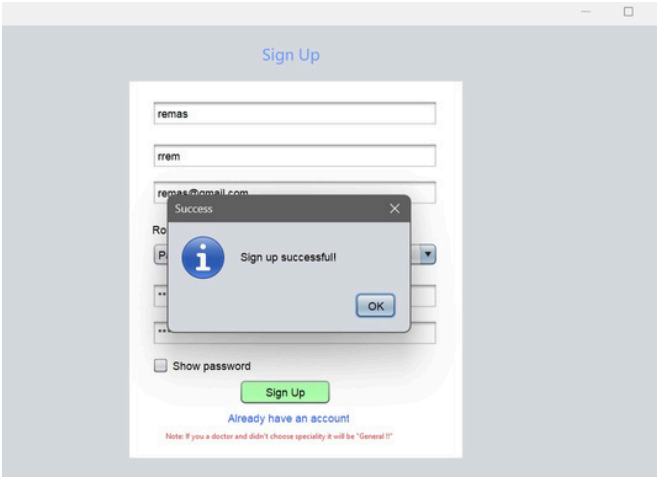
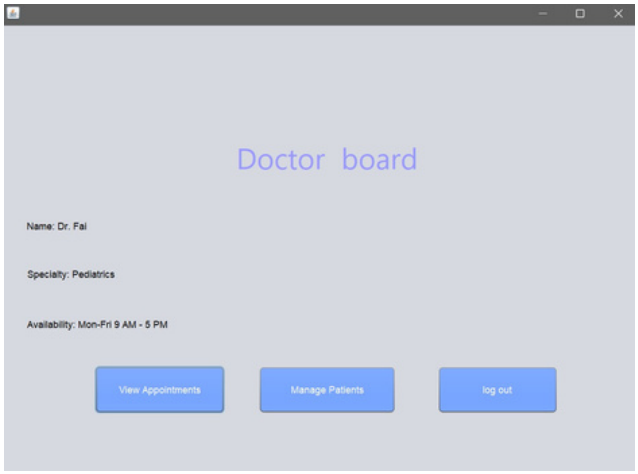


Fig.3

This message is displayed when an account has been successfully created for the Wellness Unity Center.



Program implementation and interface design:

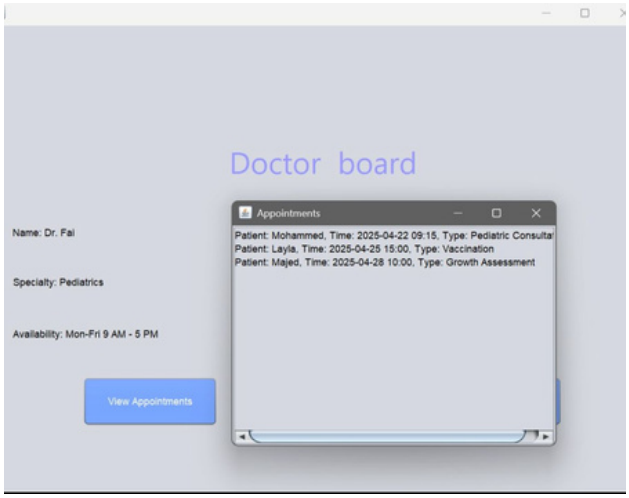


Fig.5

The doctor's dashboard displays the doctor's name, specialty, and availability. It also provides access to view scheduled appointments and manage patient interactions, the doctor can securely log out of their account from this interface.

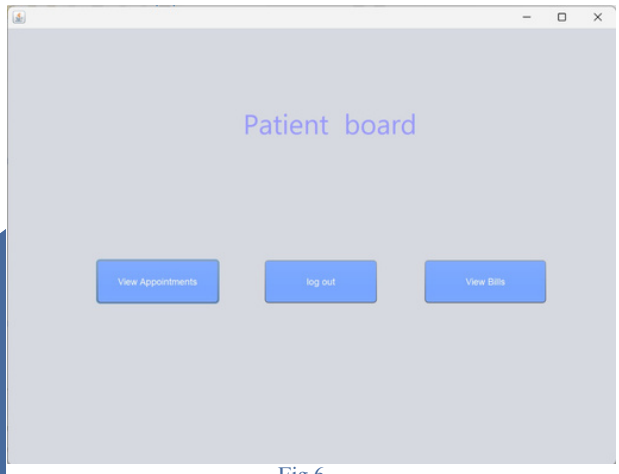


Fig.6

The Patient Dashboard provides access to view appointment details, billing information, and includes an option to securely log out.

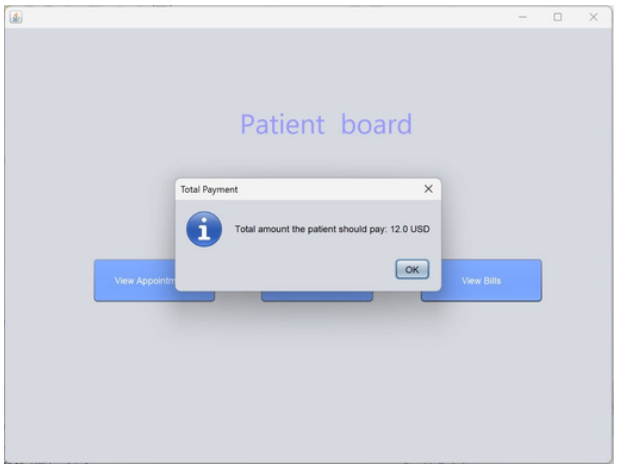


Fig.7

Displays the total amount the patient is responsible for paying.

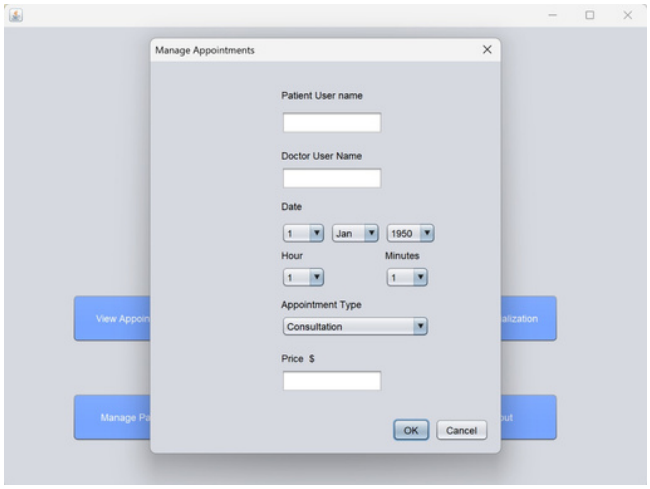


Fig.8

Appointment booking by entering the details of the patient and doctor username, selecting date, appointment type, and price.

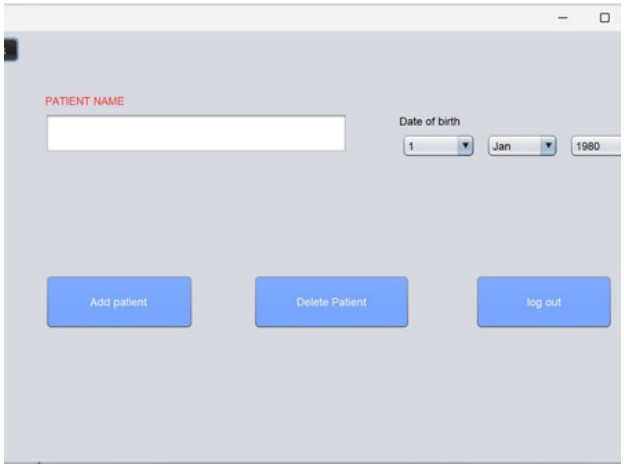


Fig.9

The receptionist can add an appointment by entering the patient's name and date of birth, as well as delete a patient record or log out of the system.

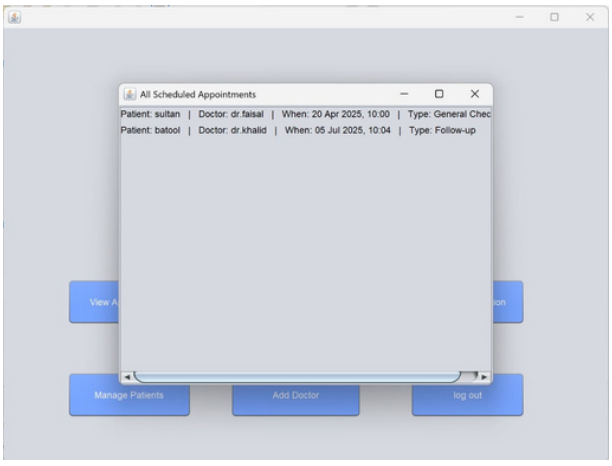


Fig.10

Display of all scheduled appointments with patient, doctor, time, and type details.

Program implementation and interface design:

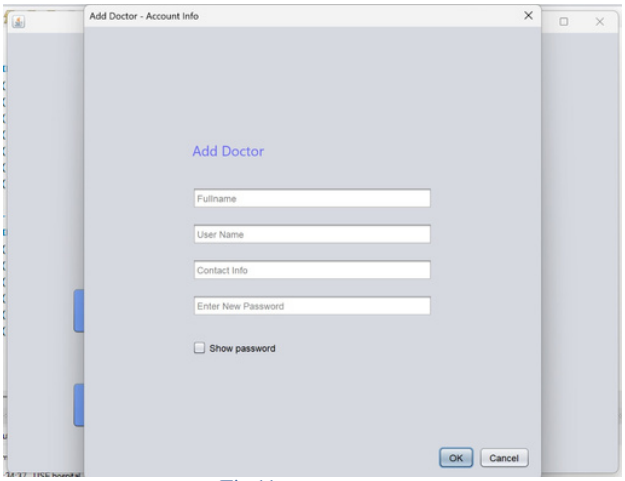


Fig.11

add doctor interface by fullname,username,contact info, and password.

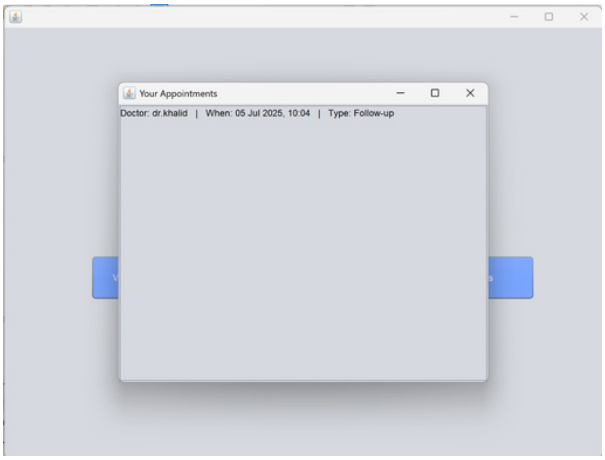


Fig.12

Displays your appointments by doctor,time.

Technologies used

- Programming Language: Java
- Database: MySQL
- JDBC Driver: MySQL Connector/J

Challenges faced during the development:

- **Screen Loading and Layout Issues:**

Some screens failed to load properly during runtime due to layout and visibility bugs. These issues were addressed by debugging layout managers and ensuring correct rendering of components.

- **Java Version and Library Compatibility:**

Integration errors occurred due to mismatches between Java versions and libraries. These were resolved by ensuring compatibility between the development environment and dependencies.

- **Data Accuracy and Error Handling:**

Ensuring accurate data and proper error handling was crucial, especially during database operations. We implemented validation and exception management to maintain system reliability.

- **MySQL-Java Connection Challenges:**

Setting up and maintaining a stable connection between the Java application and MySQL database was challenging. We overcame issues related to driver configuration and connection stability through extensive testing and optimization.

Conclusion:

Interfaces play a critical role in enhancing the overall user experience by serving as the bridge between human users and digital systems. Well-designed interfaces not only simplify interaction but also significantly improve productivity and accelerate task completion. In our Hospital Management System project, the integration of dedicated interfaces was central to our approach for improving communication and interaction among Patients, Doctors, and Receptionists. Each interface was thoughtfully designed to meet the specific functional requirements of its user group, enabling smooth navigation, easy access to relevant information, and efficient management of tasks such as appointment scheduling, medical record updates, and patient check-ins.

The implementation of these interfaces allowed us to deliver a user-centric system that streamlines operations and enhances service delivery within a hospital setting. By providing intuitive and responsive interfaces, we ensured that users could interact with the system effectively, leading to increased efficiency and reduced administrative overhead.

In addition to the interface design, we established a real-time database connection to support the continuous flow and synchronization of data across all modules. This integration ensures that all patient information, appointment details, and other critical data are consistently updated and readily accessible. By maintaining data accuracy and integrity, the database connection strengthens the reliability of the system and contributes to the overall quality of healthcare services provided. Ultimately, the combination of user-friendly interfaces and robust data management forms the foundation of an efficient, scalable, and user-focused hospital management solution.