Project Proposal

1. Project Title

Mini Smart Healthcare System

2. Team Information

Name	Email	Module Responsibility
Md. Afikur Rahman Khan	MdAfikurRahmanKhan@my.unt.edu	All modules (individual project)

3. Problem Statement

Many small clinics and individual practitioners still rely on paper records, making it difficult to manage patient data efficiently. This project addresses the need for a simple, digital system that helps doctors manage patient information and allows patients to access their medical history.

4. Project Description and Goals

This is a minimal version of a smart healthcare system for small clinics. The system includes role-based access for doctors, patients, and admins. Doctors can manage patient records and prescriptions, patients can view their history, and admins get basic analytics of the system.

5. System Modules and Responsibilities

- User Authentication and Authorization (Admin, Doctor, Patient)
- Patient Management (Doctor)
- Prescription Management (Doctor)
- Patient Portal (Patient)
- Analytics Dashboard (Admin)
- Entire system handled by Md. Afikur Rahman Khan

6. Database Design

The system will include tables like Users, Patients, Prescriptions, and Roles.

The ER diagram

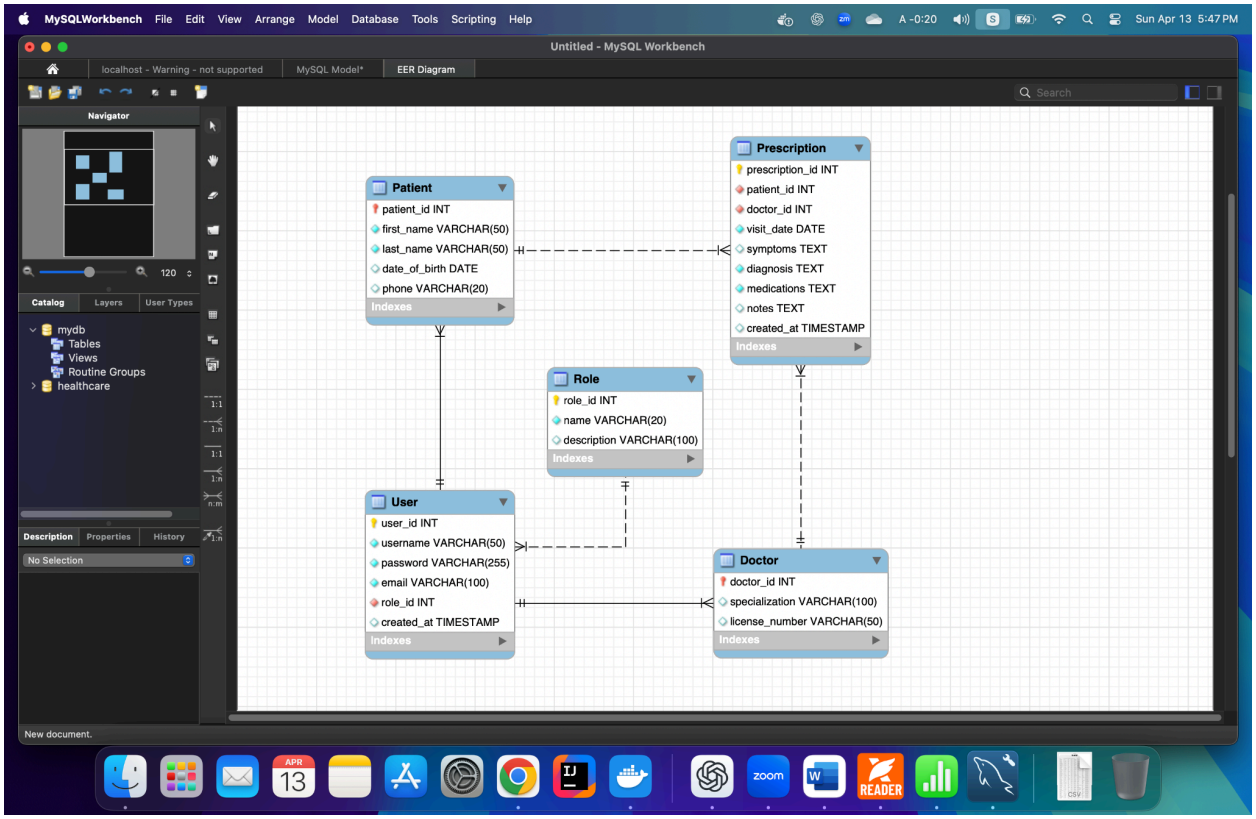


Table Structure

1. Role Table
    - role_id (PK)
    - name: Role type (Admin, Doctor, Patient)
    - description: Optional details

2. User Table
    - user_id (PK)
    - username, email, password: Login credentials
    - role_id (FK → Role): Assigns permissions

    - created_at: Timestamp for auditing
3. Patient Table
    - patient_id (PK, FK → User): Links to User table
    - first_name, last_name, date_of_birth: Basic info
    - Phone: Contact details
4. Doctor Table
    - doctor_id (PK, FK → User)
    - specialization: e.g., "Cardiology", "General Physician"
    - license_number: Unique identifier
5. Prescription Table
    - prescription_id (PK)
    - patient_id, doctor_id (FKs): Links to Patient/Doctor
    - visit_date: When the consultation happened
    - symptoms, diagnosis: Medical details
    - medications: Simple text
    - notes: Additional comments

7. Technology Stack

- Java (version 17)
- Spring Boot (framework)
- Thymeleaf (for frontend)
- MySQL (for database)
- Docker (for containerization)

8. Timeline and Milestones (2 weeks, Due April 30)

Week 1

1. Set up project with Spring Boot and MySQL
2. Create user login/register and roles (Admin, Doctor, Patient)
3. Build basic UI with Thymeleaf templates
4. Set up patient and doctor models
5. Doctors can add/view/edit patient info

Week 2:

1. Add prescription feature
2. Let patients view their records
3. Build admin dashboard with basic analytics
4. Dockerize the application
5. Final testing and polish

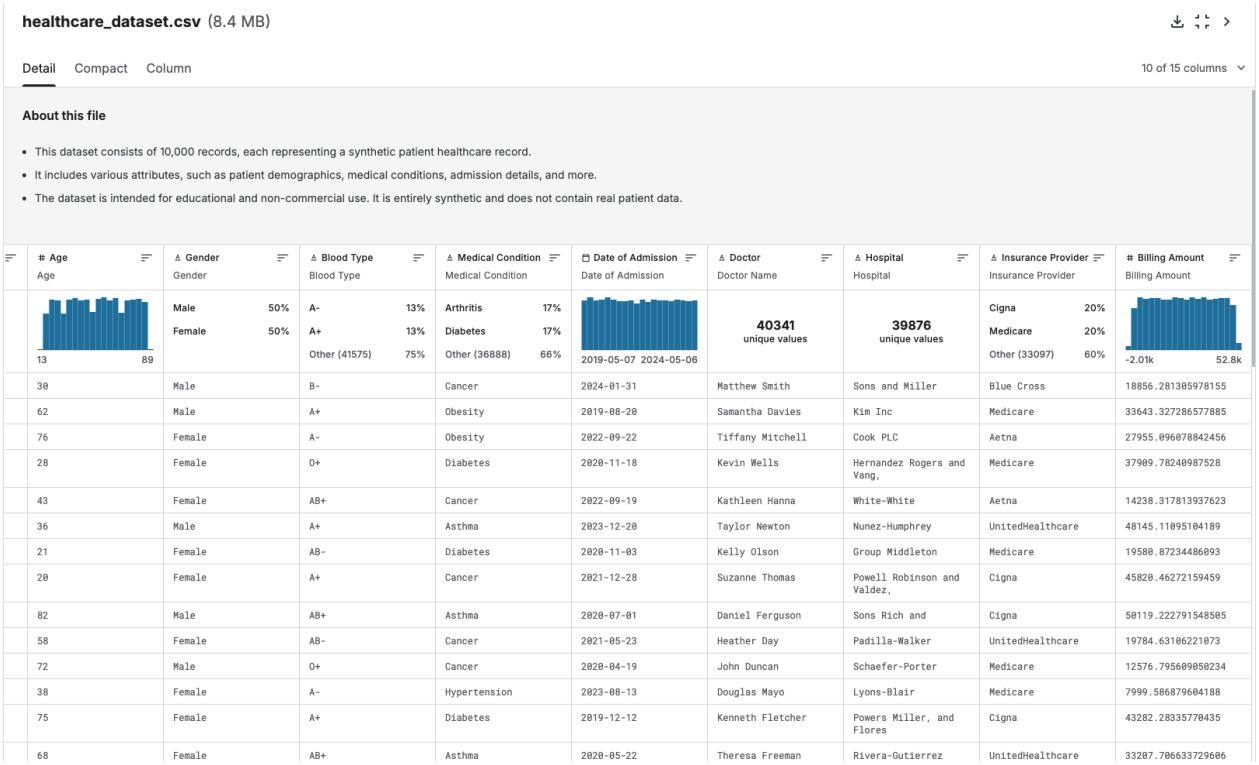
9. Challenges and Mitigation

1. Challenge: Limited time for building a full system
   Mitigation: Focus on core features only and avoid scope creep
2. Challenge: Debugging alone may be time-consuming
   Mitigation: Allocate buffer time in the second week for testing and fixes

10. Sample Data or Sources

Kaggle dataset for healthcare

https://www.kaggle.com/datasets/prasad22/healthcare-dataset?resource=download



healthcare_dataset.csv (8.4 MB)

Detail Compact Column 10 of 15 columns

About this file

- This dataset consists of 10,000 records, each representing a synthetic patient healthcare record.
- It includes various attributes, such as patient demographics, medical conditions, admission details, and more.
- The dataset is intended for educational and non-commercial use. It is entirely synthetic and does not contain real patient data.

Age	Gender	Blood Type	Medical Condition	Date of Admission	Doctor	Hospital	Insurance Provider	Billing Amount
13 – 89	Male 50% Female 50%	A- 13% A+ 13% Other (41575) 75%	Arthritis 17% Diabetes 17% Other (36888) 66%	2019-05-07 – 2024-05-06	40341 unique values	39876 unique values	Cigna 20% Medicare 20% Other (33097) 60%	-2.01k – 52.8k
30	Male	B-	Cancer	2024-01-31	Matthew Smith	Sons and Miller	Blue Cross	18856.281305978155
62	Male	A+	Obesity	2019-08-20	Samantha Davies	Kim Inc	Medicare	33643.327286577885
76	Female	A-	Obesity	2022-09-22	Tiffany Mitchell	Cook PLC	Aetna	27955.096078842456
28	Female	O+	Diabetes	2020-11-18	Kevin Wells	Hernandez Rogers and Vang,	Medicare	37909.78240987528
43	Female	AB+	Cancer	2022-09-19	Kathleen Hanna	White-White	Aetna	14238.317813937623
36	Male	A+	Asthma	2023-12-20	Taylor Newton	Nunez-Humphrey	UnitedHealthcare	48145.11095104189
21	Female	AB-	Diabetes	2020-11-03	Kelly Olson	Group Middleton	Medicare	19580.87234486093
20	Female	A+	Cancer	2021-12-28	Suzanne Thomas	Powell Robinson and Valdez,	Cigna	45820.46272159459
82	Male	AB+	Asthma	2020-07-01	Daniel Ferguson	Sons Rich and	Cigna	50119.222791548505
58	Female	AB-	Cancer	2021-05-23	Heather Day	Padilla-Walker	UnitedHealthcare	19784.63106221073
72	Male	O+	Cancer	2020-04-19	John Duncan	Schaefer-Porter	Medicare	12576.795609050234
38	Female	A-	Hypertension	2023-08-13	Douglas Mayo	Lyons-Blair	Medicare	7999.586879604188
75	Female	A+	Diabetes	2019-12-12	Kenneth Fletcher	Powers Miller, and Flores	Cigna	43282.28335770435
68	Female	AB+	Asthma	2020-05-22	Theresa Freeman	Rivera-Gutierrez	UnitedHealthcare	33207.706633729606