U of U Health

Hospital Management System

IS 6420-001 Fall 23 Database Theory and Design

REPORT

Group 9

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EXECUTIVE SUMMARY

This tool is pivotal in ensuring a more streamlined, efficient, and secure exchange of patient data. Healthcare professionals can easily access comprehensive medical histories, lab results, and imaging data in real-time. This accessibility facilitates informed and timely decision-making.

Patients utilizing services across different locations benefit immensely from this seamless integration. Every piece of essential information is readily available, ensuring personalized and consistent care. Doctors and specialists can collaborate effectively, sharing insights and information irrespective of their geographical locations, which in turn enhances the quality of care delivered.

Administrators will find immense value in our tool. Enhanced coordination of billing, appointment scheduling, and monitoring doctor availability becomes possible. Furthermore, embedded real-time data analytics and reporting features provide actionable insights, contributing to improved operational efficiency and patient satisfaction.

Above all, the foundation of our database is security and privacy. With robust encryption and authentication protocols, we safeguard sensitive patient data, ensuring compliance with the highest data protection and privacy standards. This commitment underscores our dedication to a more collaborative, efficient, and patient-centric healthcare environment.

The primary objectives of this project are to:

- Efficiently manage patient data, ensuring accuracy, security, and ease of access.
- Facilitate doctor-patient interactions through appointment scheduling and medical record management.
- Simplify billing processes, allowing for easy tracking of patient expenses and payment status.
- Maintain an up-to-date pharmacy inventory to ensure the availability of medications.
- Enable efficient tracking of laboratory tests and results for improved patient care.
- Implement a role-based user management system for secure access control.

GENERAL DESCRIPTION

The University of Utah Health (U of U Health) is a leading academic health sciences center devoted to delivering top-quality patient care, advancing medical knowledge through research, and training the upcoming generation of healthcare professionals. As part of the University of Utah, U of U Health integrates patient care, education, and research to create an environment where the best healthcare is available.

The University of Utah Hospital System was founded in 1965 following the closure of Salt Lake County General Hospital. Starting off with a basic intensive care unit they have grown into a major system of both patient care and research. Their crowning jewel has been the evolution of the Huntsman Cancer Center breaking ground in 2004. Starting off with only 50 beds, currently the Huntsman Cancer Center has grown to over 100 patients a year and is a leading force in cancer research with 237 research teams dedicated to studying all forms of cancer.

Vision and Objectives:

The vision of U of U Health is to be a model for excellence in patient care, education, and research. Its objectives include:

- Delivering patient-centered care with a focus on innovation.
- Advancing medical knowledge through cutting-edge research.
- Educating healthcare professionals to meet the evolving needs of the community.

Products/Services:

U of U Health offers comprehensive medical services, including primary and specialty care, surgical services, emergency care, and advanced treatments. The organization is also at the forefront of medical research, contributing to breakthroughs in various fields. Educational programs provided by U of U Health include medical and nursing schools, fostering the development of the next generation of healthcare leaders.

Use of Transactional Database:

Transactional databases play a pivotal role in supporting the day-to-day operations of U of U Health. These databases are utilized across various departments, including patient management, billing, appointment scheduling, and inventory management. For instance, in the hospital management system, transactional databases track patient admissions, manage doctor appointments, process billing and payments, and maintain electronic health records. This ensures the seamless flow of information and enables healthcare professionals to make informed decisions.

U of U Health is renowned for its commitment to advancing medical knowledge. It is home to cutting-edge research facilities and collaborative initiatives contributing to medical breakthroughs. The organization embraces a patient-centric approach, prioritizing the well-being and experience of individuals seeking healthcare services. With a strong emphasis on

education, U of U Health provides excellent patient care and nurtures future healthcare practitioners' skills and knowledge.

PRIORITY REQUIREMENT SUMMARY

In response to the growing complexity of healthcare services, the project seeks to enhance the efficiency, accuracy, and accessibility of patient data, medical records, and administrative processes.

Scope of the Project

The scope of the Hospital Management System encompasses various aspects of healthcare management, including:

1. Patient Information Management

The system provides a centralized database for storing and managing patient information, ensuring data accuracy and confidentiality. Patients are uniquely identified by a PatientID, allowing for efficient tracking of their medical history, contact details, and insurance information.

2. Doctor-Patient Interaction

Appointment scheduling is streamlined through the system, facilitating efficient communication between doctors and patients. Medical records are electronically maintained, ensuring easy access to patient diagnoses, treatments, and prescriptions.

3. Billing and Financial Management

The project simplifies billing procedures, allowing for the efficient tracking of patient expenses and payment status. It ensures transparency in financial transactions, reducing errors and improving revenue management.

4. Pharmacy Inventory Management

The system maintains an up-to-date pharmacy inventory, enabling healthcare providers to ensure the availability of essential medications. Medication details are meticulously recorded, including name, description, price, and stock quantity.

5. Laboratory Test Tracking

Efficient tracking of laboratory tests and results enhances patient care. LabTests and LabResults tables store information about tests, their descriptions, prices, and results, with links to patients and doctors.

6. Lab Results Tracking

The presence of both table lab tests and lab results in the model supports enhanced data granularity, where every test and its corresponding result are meticulously documented. This bifurcation aids in avoiding data congestion and ensures that each piece of information is easily retrievable and understandable. It also facilitates better analytics, allowing for detailed insights into patterns of test prescriptions, their frequencies, and their outcomes.

7. User Access Control

A role-based user management system ensures secure access control, allowing staff members to access only the data relevant to their roles. This safeguards patient information and maintains data integrity.

8. Departments Table

The Department table is integral in the healthcare database, connecting to the Hospital, Doctor, and Room tables. It organizes departments within a hospital, each identified with a unique ID and associated with specific hospitals and resources. Users can understand the hospital’s structure and resource allocation through this table, aiding in efficient management. It provides insights into departmental functionalities and specializations, enhancing operational efficiency. Thus, it's pivotal for informed decision-making and optimizing patient care.

9. Diagnosis Table

The diagnosis table is essential in storing detailed information about patients' medical conditions, identified by a unique diagnosis ID. It connects directly to the Patient and Medical Record tables, ensuring that each medical condition is associated with a specific patient and their medical history. This table becomes a critical resource for healthcare professionals to track, manage, and analyze patients' health conditions over time. Users can quickly retrieve accurate and up-to-date diagnosis information, aiding in effective treatment planning. Overall, the Diagnosis table is instrumental in enhancing personalized patient care and treatment accuracy.

10. Appointments Table

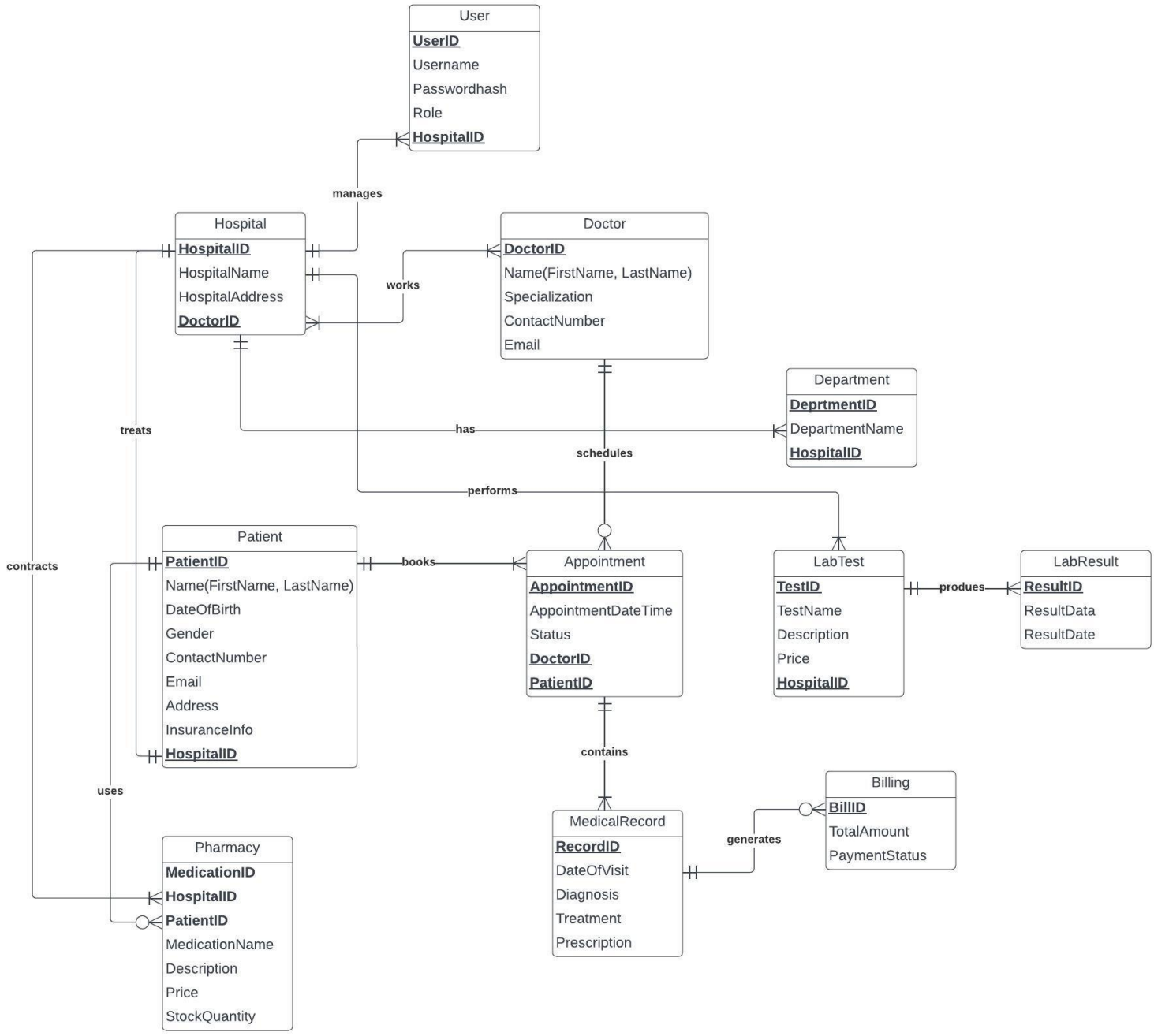
The Appointment table manages scheduling between patients and doctors, containing essential data like appointment dates and statuses. It's linked to both Patient and Doctor tables, ensuring organized and efficient appointment tracking. This table aids in enhancing the patient's journey through timely and well-managed consultations.

11. Room Table

The Room table catalogs the various rooms within a hospital, including their types and locations. It’s connected to the Department and Hospital tables, offering insights into the allocation and availability of rooms. This table is essential for efficient hospital resource management and patient accommodation planning.

The data for the "University of Utah Hospital" Database Project is generated from Mockaroo, a powerful data mocking and generation platform. Mockaroo provides a flexible and customizable environment for generating realistic and diverse datasets, which are essential for populating our hospital's database. By using Mockaroo, we can simulate a wide range of patient records, medical histories, billing information, and clinical data to ensure the completeness and integrity of our database. Mockaroo's versatility enables us to create a dataset that closely mirrors real-world scenarios, allowing for thorough testing and validation of our database system. This approach not only enhances the accuracy of our data but also ensures that our database can effectively handle the various types of information crucial to the hospital's operations.

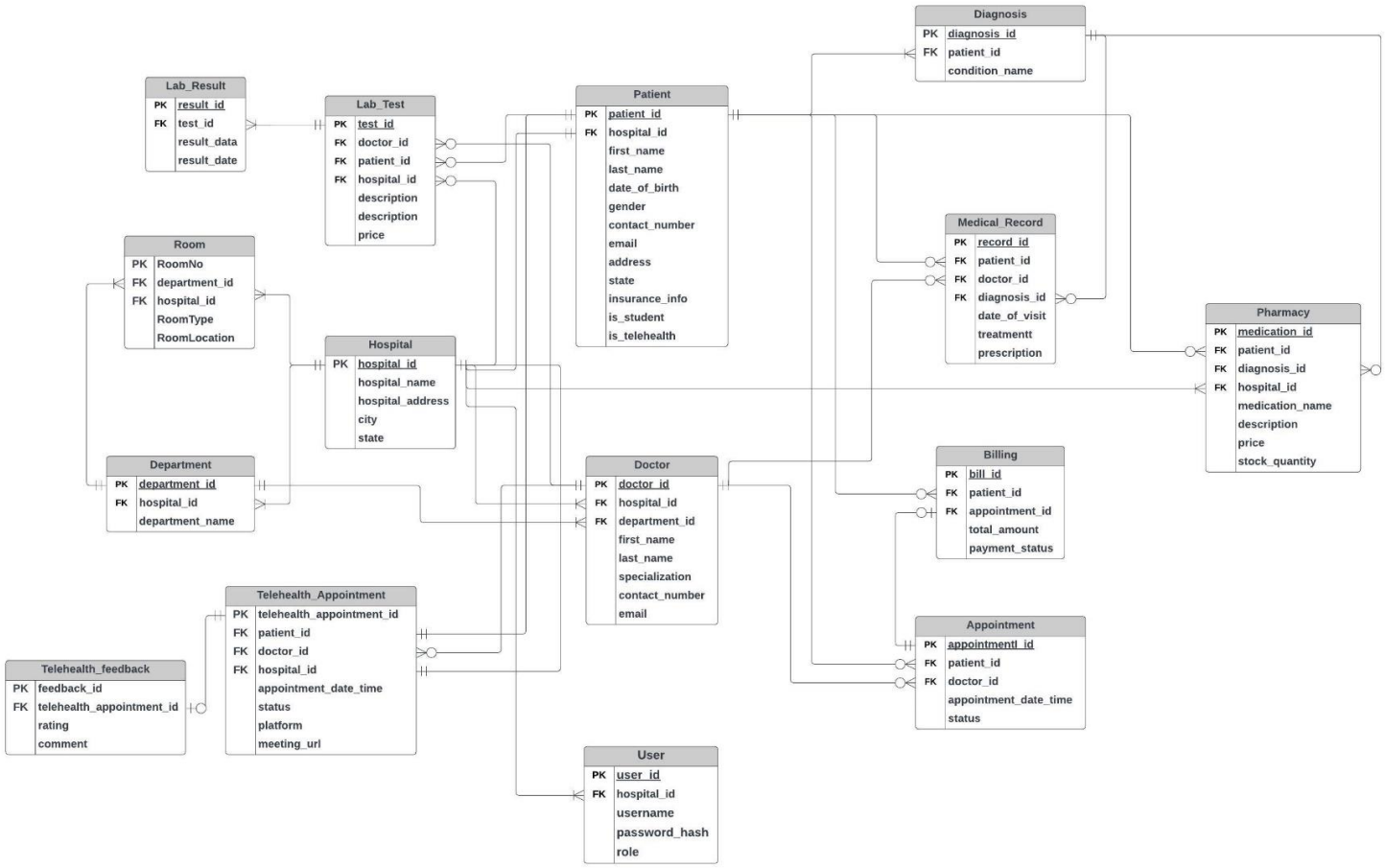
CONCEPTUAL MODEL



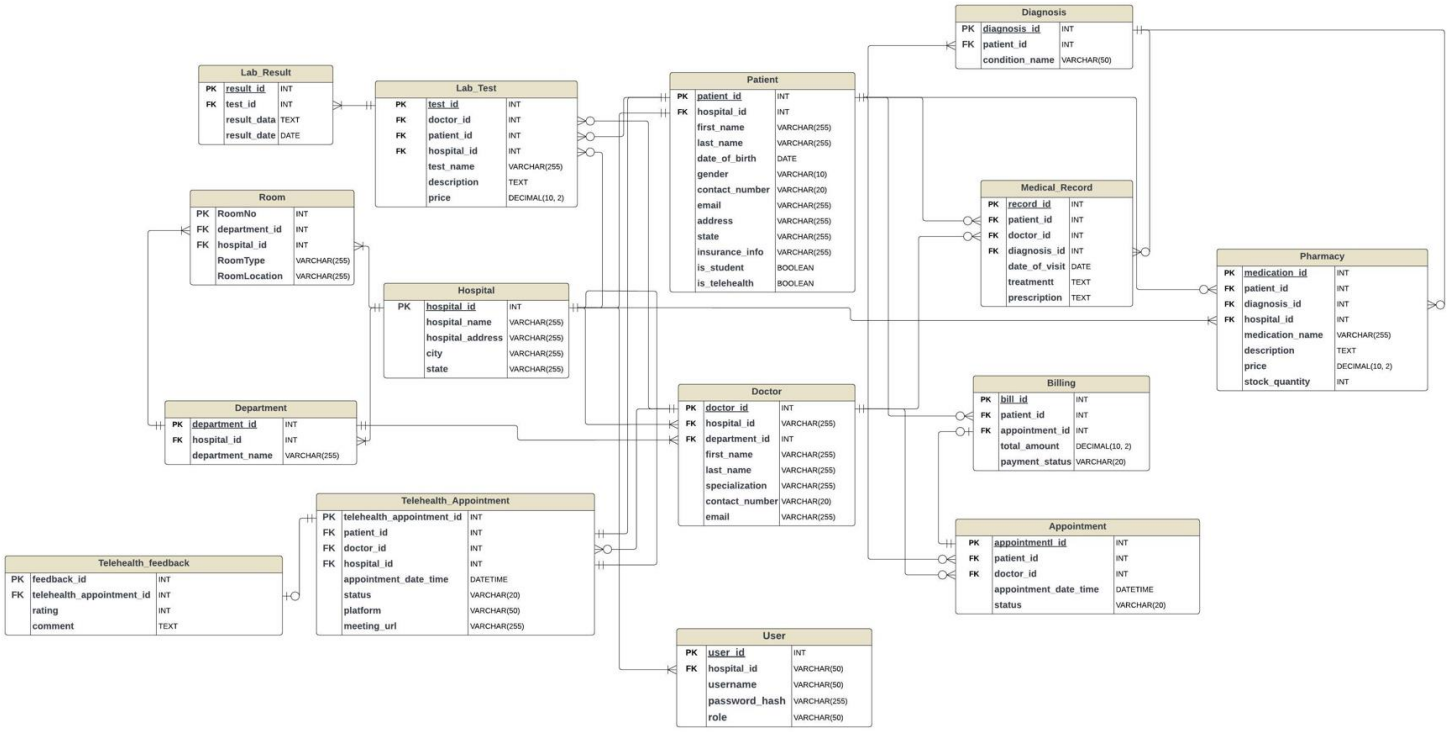
The conceptual model above represents the business requirements of the University of Utah Health-Hospital Management System.

LOGICAL MODEL

The logical model below converts the conceptual model into a more detailed, structured in Third Normal form (3 NF).



PHYSICAL MODEL



The physical model shows the actual physical implementation of the database design of the University of Utah Health-Hospital Management System.

It details the actual tables, columns, data types, and constraints, transforming the logical model into a functional database structure.

The "Hospital" table acts as a central hub, connecting to numerous other tables such as "Patient," "Doctor," and more through foreign keys to create a coherent network of associations.

REQUIREMENTS REVIEW

1. **Patient Information Management**
    a. **Status:** Complete
    b. **Context:** We have successfully implemented a centralized database for storing and managing patient information, ensuring data accuracy and confidentiality. Each patient is uniquely identified by a PatientID, facilitating efficient trafficking of their medical history, contact details, and insurance information.
2. **Doctor-Patient Interaction**
    a. **Status:** Complete
    b. **Context:** The appointment scheduling is fully functional, and electronic maintenance of medical records is streamlined. Doctors and patients can efficiently communicate, and all necessary information is easily accessible.
3. **Billing and Financial Management**
    a. **Status:** Complete
    b. **Context:** We have developed a comprehensive billing procedure that allows efficient tracking of patient expenses and payment statuses, ensuring transparency in financial transactions.
4. **Pharmacy Inventory Management**
    a. **Status:** Complete
    b. **Context:** The system maintains an updated pharmacy inventory, recording details like medical name, description, price, and stock quantity, ensuring the availability of essential medications.
5. **Laboratory Test Tracking**
    a. **Status:** Complete
    b. **Context:** Lab tests and results are efficiently tracked and stored in dedicated tables, ensuring easy retrieval and understanding, facilitating enhanced patient care.
6. **User Access Control**
    a. **Status:** Complete
    b. **Context:** A role-based user management system has been implemented, allowing staff members access only to data relevant to their roles, ensuring patient information security and data integration.
7. **HIPPA Protocol Compliance**
    a. **Status:** Complete
    b. **Context:** We strictly adhere to HIPPA protocols, ensuring that patient privacy and data security are paramount. All of the necessary security measures, including data encryption and role-based access controls, have been implemented.
8. **Telehealth Services**
    a. **Status:** Complete
    b. **Context:** We integrated Telehealth services effectively, enabling the management of Telehealth appointments and collection of patient feedback to continually refine the services.
9. **Predictive Modeling for In-Patient Out-Patient Triage**
    a. **Status:** Complete

b. **Context:** We have created a function for the future so clinics can effectively predict who needs to be assigned to in-patient care versus out-patient care.

Conclusion:

The “ideal requirements” have been successfully implemented, with each contributing to a more streamlined, efficient, and secure exchange of patient data. The system is designed not just for the present but is adaptable to meet future healthcare demands, marking U of U Health as a pioneering institution in the integration of technological advancements in healthcare delivery.

ETHICAL CONSIDERATIONS

HIPAA Protocol Compliance

Introduction

Healthcare data security and patient privacy are of paramount importance in the Hospital Management System project for the University of Utah Health. To ensure that the system complies with the highest standards of data protection and patient confidentiality, the project adheres to the Health Insurance Portability and Accountability Act (HIPAA) protocol. HIPAA is a critical regulation in the healthcare industry, established to safeguard patient information and protect the rights of individuals receiving medical services.

Key HIPAA Compliance Considerations

The Hospital Management System project addresses several key HIPAA compliance considerations:

1. **Protected Health Information (PHI)**: HIPAA defines PHI as individually identifiable health information. Within the project, patient data, medical records, and related information fall under the scope of PHI. Stringent measures are in place to ensure the confidentiality, integrity, and availability of PHI. This also includes safeguards to ensure it is meeting the standards for minimum necessary information.
2. **Access Control**: Role-based access control is implemented to limit system access to authorized personnel only. This ensures that patient data is only accessible to individuals with a legitimate need to access it.
3. Encryption: Data encryption is applied to protect information both in transit and at rest. This safeguards patient data from unauthorized access or interception.
4. **Audit Trails**: The system maintains detailed audit trails to record user activities, ensuring accountability and traceability. In the event of unauthorized access or data breaches, audit logs can provide critical information for investigations.
5. **Business Associate Agreements (BAAs)**: The project involves third-party service providers, such as cloud hosting or software vendors. BAAs are established with these entities to ensure they also comply with HIPAA regulations and safeguard patient data.
6. **Training and Awareness**: Staff members are provided with HIPAA training and awareness programs to educate them on the importance of patient privacy and data security. This includes guidelines for handling, storing, and sharing patient information.

7. **Patient Consent and Data Sharing**

The project acknowledges the importance of patient consent and data sharing in compliance with HIPAA. Patients are informed about how their data will be used, and their explicit consent is obtained for sharing information with relevant healthcare providers and stakeholders involved in their care.

8. **Continuous Compliance Monitoring**

Compliance with HIPAA is an ongoing process. The Hospital Management System project includes continuous monitoring and assessment of security measures to identify and rectify potential vulnerabilities. Regular audits are conducted to ensure that the system aligns with evolving HIPAA requirements.

NEW VENTURE IDEAS

Telehealth Service:

We propose an innovative expansion into telehealth services in the New Venture chapter of the U of U Health - Hospital Management System project. This strategic move aims to harness the potential of digital technology to deliver health-related services and information, thereby elevating patient care—especially in response to the global shift towards remote work and social distancing.

To facilitate this initiative, we have introduced two new tables into our database: TelehealthAppointments and TelehealthFeedback.

The TelehealthAppointments table is designed for the meticulous management of all telehealth appointments. It encompasses fields for the appointment ID, patient ID, Doctor ID, appointment date and time, appointment status, the platform used for the telehealth session, meeting URL, and hospital ID. Notably, the patient ID, Doctor ID, and hospital ID fields are foreign keys referencing the Patients, Doctors, and Hospital tables, respectively. This design ensures data integrity and establishes transparent relationships between entities within our database.

Complementing this, the second table, TelehealthFeedback, is tailored to enhance the quality of our telehealth services. It includes fields for feedback ID, telehealth appointment ID (referencing the TelehealthAppointments table), rating, and comments. This table serves as a valuable conduit for patients to provide feedback on their telehealth experience, which, in turn, will be instrumental in continually refining and customizing the hospital services to meet the unique needs of patients.

By seamlessly integrating these tables into our existing hospital management system, we position ourselves to manage telehealth appointments and glean insights from patient feedback effectively. This strategic initiative broadens our service offerings and positions U of U Health as a forward-thinking institution ready to adapt to the dynamic landscape of healthcare delivery.

Teleradiology with the use of AI -

Tele-radiology refers to the practice of transmitting radiological images, such as X-rays, CT scans, MRIs, and other medical images, from one location to another for the purpose of interpretation and diagnosis by a radiologist or medical specialist who is not physically present at the original imaging facility. This enables the remote interpretation of medical images, often

in real-time, by experts located at a different site, which can be in the same hospital, a different city, or even a different country.

Key features of tele-radiology include:

1. Image Transmission: Radiological images are transmitted digitally from the imaging facility (e.g., a hospital, clinic, or imaging center) to the remote radiologist's location via secure and high-speed internet connections.

2. Remote Interpretation: The remote radiologist reviews and analyzes the images on specialized computer workstations, providing diagnostic reports and recommendations for patient care.

3. Real-time or Delayed Interpretation: Tele-radiology can be used for real-time interpretations in emergency situations or for routine interpretations with a delayed turnaround time.

4. Improving Access to Radiology Services: Tele-radiology helps address issues related to the shortage of radiologists in certain areas, enabling patients in underserved regions to access timely radiological diagnosis and care.

5. Quality Control: Tele-radiology services often include quality control measures to ensure the accuracy and reliability of image interpretation.

6. Integration with Healthcare Systems: Tele-radiology solutions are often integrated into hospital and healthcare information systems for seamless workflow management.

7. Privacy and Security: Given the sensitivity of medical images, tele-radiology systems prioritize data privacy and security to protect patient information.

Advantages:

Teleradiology offers several advantages that contribute to improved healthcare delivery and patient outcomes. Here are some of the key benefits of teleradiology:

1. Timely Access to Radiological Expertise: Teleradiology allows healthcare facilities to access specialized radiologists and their expertise, even in remote or underserved areas. This ensures that patients receive timely and accurate interpretations of their medical images.

2. Emergency Care: In emergency situations, where immediate diagnosis is crucial, teleradiology enables rapid image transfer and expert interpretation, helping healthcare providers make quick and informed decisions.

3. Extended Coverage: Teleradiology can provide 24/7 coverage, allowing healthcare facilities to have access to radiological services during non-working hours, weekends, and holidays, reducing delays in patient care.

4. Reduced Geographic Barriers: Patients in rural or remote locations can receive the same level of radiological care as those in urban areas, eliminating geographic barriers to healthcare access.

5. Optimized Workflow: Teleradiology can streamline the radiology workflow by distributing image interpretation tasks efficiently. This can lead to faster turnaround times for diagnostic reports and better resource allocation.

6. Cost-Efficiency: Teleradiology can be cost-effective for healthcare facilities, as they can avoid the expense of hiring and retaining full-time, on-site radiologists while still providing high-quality radiological services.

7. Improved Quality Control: Teleradiology services often include quality control measures, ensuring that interpretations are accurate and consistent across different facilities and radiologists.

8. Access to Subspecialists: Teleradiology networks can connect facilities with subspecialist radiologists who have expertise in specific areas such as neuroradiology, musculoskeletal radiology, or pediatric radiology, enhancing the accuracy of diagnoses.

9. Reduction in Patient Transfers: By obtaining remote radiological expertise, healthcare facilities can reduce the need to transfer patients to other facilities for specialized care, saving time and reducing patient stress.

10. Enhanced Educational Opportunities: Teleradiology can facilitate collaboration and learning opportunities among radiologists and medical professionals, promoting ongoing education and skill development.

11. Privacy and Security: Teleradiology services prioritize data privacy and security, ensuring that patient information and medical images are protected.

12. Scalability: Teleradiology services can easily scale up or down to meet the demands of healthcare facilities, making it adaptable to changing patient loads and needs.

Tele-radiology has become an essential component of modern healthcare, facilitating timely and accurate diagnosis and treatment decisions, particularly in situations where on-site radiologists are not available or during off-hours. It helps bridge geographic and time gaps, making specialized radiological expertise more accessible and improving patient care.

CONCLUSION

The U of U Health Hospital Management System is a well-integrated tool designed to enhance healthcare delivery and operational efficiency. It combines real-time data access, administrative efficiency, and improved patient-doctor interactions. This system is not limited to the current needs but extends its applicability to future demands, particularly in the realm of telemedicine, making healthcare both a physical and digital experience.

Our adherence to HIPAA protocols underscores our serious commitment to patient privacy and data security. It's not merely about compliance but about setting up a foundation of trust and integrity for both patients and medical professionals.

We've gathered valuable insights into the demographics using the University of Utah Healthcare, and we have analyzed the range of medical procedures and the effectiveness of appointment scheduling and billing systems.

The design and functionalities of this system aren't exclusive to the University of Utah Health System. Its adaptability means it can be customized to fit the needs of different hospitals and universities across various states. The intended outcome is a smoother operation for medical staff, clearer processes for administrators, and enhanced care for patients, ensuring they receive the proper treatments and medications prompt and efficiently.

The project's strict adherence to HIPAA protocol is a testament to its commitment to safeguarding patient privacy and ensuring data security. By integrating HIPAA-compliant practices into the system's design, development, and operational phases, the Hospital Management System aims to uphold the highest standards of healthcare data protection while supplying quality services to patients at the University of Utah Health.

This section emphasizes the project's commitment to HIPAA compliance, highlighting key considerations and practices to ensure the confidentiality and security of patient information in line with healthcare regulations.

REFERENCES

Logo: U of U Health. (n.d.). Healthcare.utah.edu. Reference

History & Achievements of U of U Health. (2022, August 1). University of Utah Health | University of Utah Health. Reference

Quick Facts. (2022, September 14). Huntsman Cancer Institute | University of Utah Health. Reference

SQL Data Generator: Reference

HIPPA Compliance: Reference

APPENDIX

TEAM MEMBER	HOURS SPENT	DESCRIPTION OF WORK	ADDITIONAL COMMENTS
Scott Silverstein	20	Data Generation with Mockaroo syncing with sql table creation, Report	
Rajasekhar Madabattula	20	Database Creation and Insertion of Values, Data Cleaning, Tableau Charts	
Michael Tetteh	20	Conceptual Design, Logical Design, and Physical Model	
Kunal Kodam	20	Data Cleaning, Report, Presentation	

SQL STATEMENTS

```
-- Drop tables if they exist
DROP TABLE IF EXISTS hospital cascade;
DROP TABLE IF EXISTS patient cascade;
DROP TABLE IF EXISTS department cascade;
DROP TABLE IF EXISTS doctor cascade;
DROP TABLE IF EXISTS appointment cascade;
DROP TABLE IF EXISTS room cascade;
DROP TABLE IF EXISTS user_table cascade;
DROP TABLE IF EXISTS lab_test cascade;
DROP TABLE IF EXISTS lab_result cascade;
DROP TABLE IF EXISTS diagnosis cascade;
DROP TABLE IF EXISTS billing cascade;
DROP TABLE IF EXISTS medical_record cascade;
DROP TABLE IF EXISTS pharmacy cascade;
DROP TABLE IF EXISTS telehealth_appointment cascade;
DROP TABLE IF EXISTS telehealth_feedback cascade;


-- Creating tables needed for creating the database.
-- Hospital Table
CREATE TABLE hospital (
hospital_id INT PRIMARY KEY,
hospital_name VARCHAR (255),
hospital_address VARCHAR (255),
city VARCHAR (255),
state VARCHAR (255)
);


-- Patient Table
CREATE TABLE patient (
patient_id INT PRIMARY KEY,
first_name VARCHAR (255),
last_name VARCHAR (255),
date_of_birth DATE,
gender VARCHAR (10),
contact_number VARCHAR (20),
email VARCHAR (255),
address VARCHAR (255),
```

```
state VARCHAR (255),
insurance_info VARCHAR (255),
is_student BOOLEAN,
is_telehealth BOOLEAN,
hospital_id INT,
FOREIGN KEY (hospital_id) REFERENCES hospital(hospital_id)
);


-- Department Table
CREATE TABLE department (
department_id INT PRIMARY KEY,
department_name VARCHAR (255),
hospital_id INT,
FOREIGN KEY (hospital_id) REFERENCES hospital(hospital_id)
);


-- Doctor Table
CREATE TABLE doctor (
doctor_id INT PRIMARY KEY,
first_name VARCHAR (255),
last_name VARCHAR (255),
specialization VARCHAR (255),
contact_number VARCHAR (20),
email VARCHAR (255),
department_id INT,
hospital_id INT,
FOREIGN KEY (department_id) REFERENCES department(department_id),
FOREIGN KEY (hospital_id) REFERENCES hospital(hospital_id)
);


-- Appointment Table
CREATE TABLE appointment (
appointment_id INT PRIMARY KEY,
patient_id INT,
doctor_id INT,
appointment_date_time DATE,
status VARCHAR (20),
FOREIGN KEY (patient_id) REFERENCES patient(patient_id),
FOREIGN KEY (doctor_id) REFERENCES doctor(doctor_id)
```

```
);


-- Room Table
CREATE TABLE room (
room_no INT PRIMARY KEY,
room_type VARCHAR (255),
room_location VARCHAR (255),
department_id INT,
hospital_id INT,
FOREIGN KEY (department_id) REFERENCES department(department_id),
FOREIGN KEY (hospital_id) REFERENCES hospital(hospital_id)
);


-- User (User Management) Table
CREATE TABLE user_table (
user_id INT PRIMARY KEY,
username VARCHAR (50),
password_hash VARCHAR (255),
role VARCHAR (50),
hospital_id INT,
FOREIGN KEY (hospital_id) REFERENCES hospital(hospital_id)
);


-- LabTest Table
CREATE TABLE lab_test (
test_id INT PRIMARY KEY,
test_name VARCHAR (255),
description TEXT,
price DECIMAL (10, 2),
doctor_id INT,
patient_id INT,
hospital_id INT,
FOREIGN KEY (doctor_id) REFERENCES doctor(doctor_id),
FOREIGN KEY (patient_id) REFERENCES patient(patient_id),
FOREIGN KEY (hospital_id) REFERENCES hospital(hospital_id)
);


-- LabResult Table
```

```
CREATE TABLE lab_result (
result_id INT PRIMARY KEY,
test_id INT,
result_data TEXT,
result_date DATE,
FOREIGN KEY (test_id) REFERENCES lab_test(test_id)
);


-- Diagnosis Table
CREATE TABLE diagnosis (
diagnosis_id INT PRIMARY KEY,
condition_name VARCHAR (50),
patient_id INT,
FOREIGN KEY (patient_id) REFERENCES patient(patient_id)
);


-- Billing Table
CREATE TABLE billing (
bill_id INT PRIMARY KEY,
patient_id INT,
appointment_id INT,
total_amount DECIMAL (10, 2),
payment_status VARCHAR (20),
FOREIGN KEY (patient_id) REFERENCES patient(patient_id),
FOREIGN KEY (appointment_id) REFERENCES appointment(appointment_id)
);


-- MedicalRecord Table
CREATE TABLE medical_record (
record_id INT PRIMARY KEY,
patient_id INT,
doctor_id INT,
visit_date DATE,
diagnosis_id INT,
treatment TEXT,
prescription TEXT,
FOREIGN KEY (patient_id) REFERENCES patient(patient_id),
FOREIGN KEY (doctor_id) REFERENCES doctor(doctor_id),
FOREIGN KEY (diagnosis_id) REFERENCES diagnosis(diagnosis_id)
```

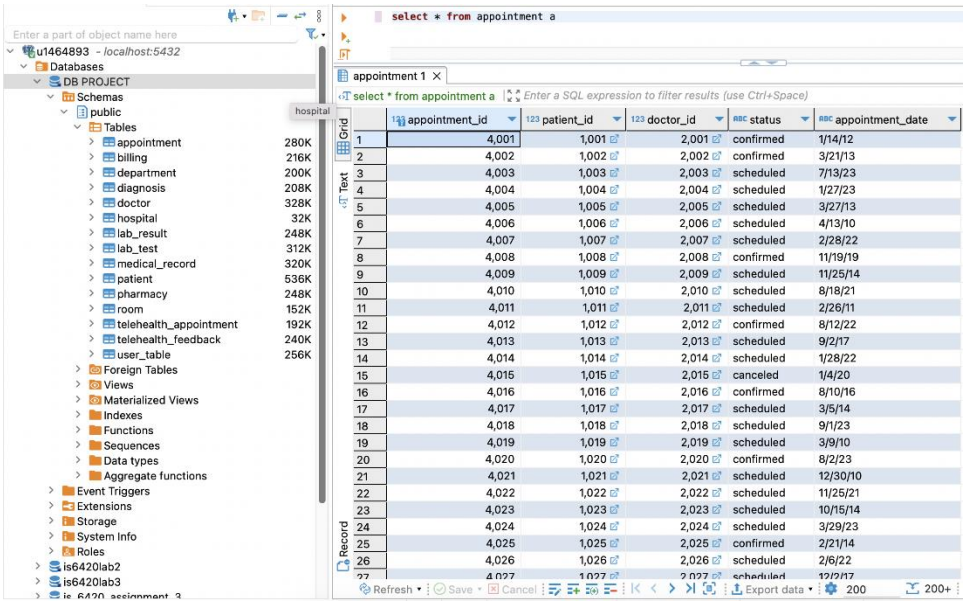
```
);


-- Pharmacy Table
CREATE TABLE pharmacy (
medication_id INT PRIMARY KEY,
medication_name VARCHAR (255),
description TEXT,
price DECIMAL (10, 2),
stock_quantity INT,
patient_id INT,
diagnosis_id INT,
hospital_id INT,
FOREIGN KEY (patient_id) REFERENCES patient(patient_id),
FOREIGN KEY (diagnosis_id) REFERENCES diagnosis(diagnosis_id),
FOREIGN KEY (hospital_id) REFERENCES hospital(hospital_id)
);


-- TelehealthAppointment Table
CREATE TABLE telehealth_appointment (
telehealth_appointment_id INT PRIMARY KEY,
apointment_date_time DATE,
status VARCHAR (20),
platform VARCHAR (50),
meeting_url VARCHAR (255),
patient_id INT,
doctor_id INT,
hospitalid INT
);


-- TelehealthFeedback Table
CREATE TABLE telehealth_feedback (
feedback_id INT PRIMARY KEY,
telehealth_appointment_id INT,
rating INT,
comments TEXT,
FOREIGN KEY (telehealth_appointment_id) REFERENCES
telehealth_appointment(telehealth_appointment_id)
);
```

```
--Inserting Values


-- Insert values into the Hospital table
INSERT INTO hospital (hospital_id, hospital_name, hospital_address, city, state)
VALUES
(3459, 'University of Utah Hospital', '20440 Fisk Plaza', 'St. George', 'UT'),
(3109, 'University of Utah Hospital', '99 Brentwood Lane', 'West Valley City', 'UT'),
(6781, 'University of Utah Hospital', '3 Lakewood Gardens Alley', 'South Salt Lake', 'UT'),
(6173, 'University of Utah Hospital', '6 Lotheville Circle', 'Herriman', 'UT'),
(4713, 'University of Utah Hospital', '1 Morningstar Trail', 'Taylorsville', 'UT'),
(9799, 'University of Utah Hospital', '643 Iowa Drive', 'Sandy', 'UT'),
(8111, 'University of Utah Hospital', '1095 Elmside Place', 'Springville', 'UT'),
(4329, 'University of Utah Hospital', '156 Anthes Park', 'Herriman', 'UT'),
(3540, 'University of Utah Hospital', '62121 Farmco Lane', 'West Valley City', 'UT');


-- Drop the last two rows from the Hospital table
DELETE FROM hospital
WHERE hospital_id IN (
SELECT hospital_id
FROM (
SELECT hospital_id
FROM hospital
ORDER BY hospital_id DESC
LIMIT 2
) AS last_two
);


INSERT INTO hospital (hospital_id, hospital_name, hospital_address, city, state)
values
(9799, 'University of Utah Hospital', '643 Iowa Drive', 'Sandy', 'UT'),
(8111, 'University of Utah Hospital', '1095 Elmside Place', 'Springville', 'UT'),
(4438, 'University of Utah Hospital', 'Elmside Place', 'North salt lake', 'UT');



-- Alter the lab_test table to change the data type of the "price" column to money
ALTER TABLE lab_test
ALTER COLUMN price TYPE money;
```

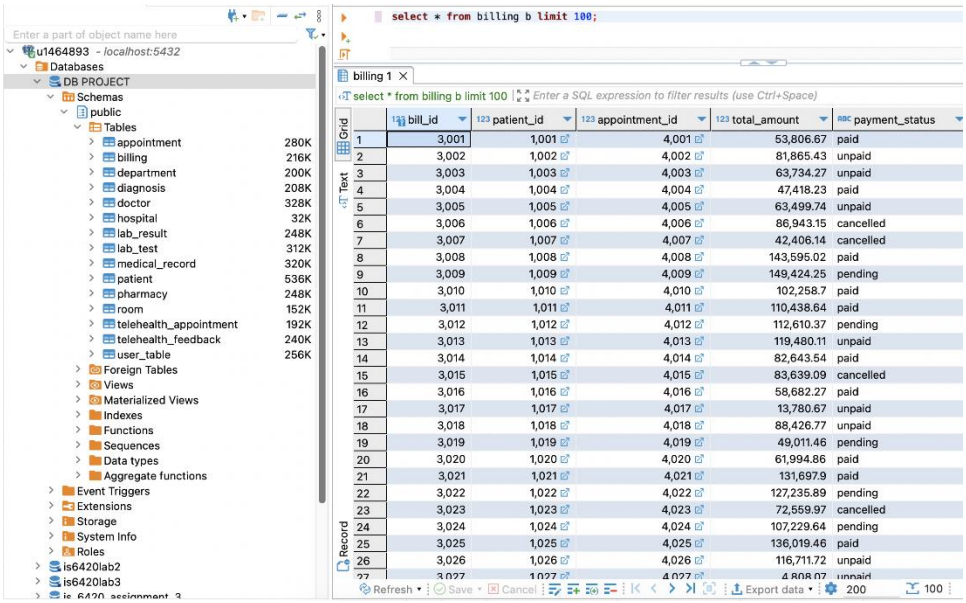
-- Alter the patient table to increase the length of the gender column
ALTER TABLE patient
ALTER COLUMN gender **TYPE character varying (**255);

-- Showing the data from the Table

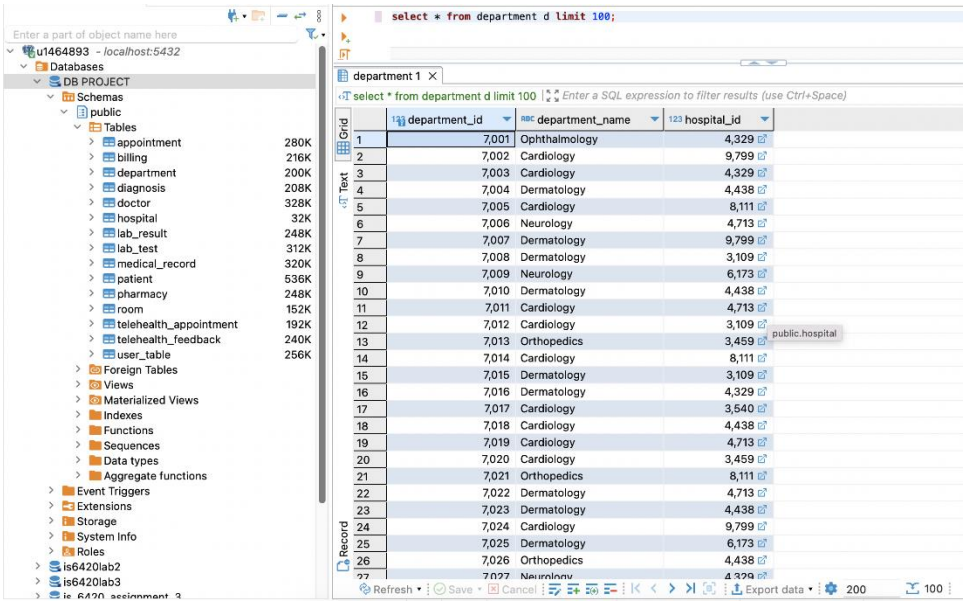
***select** * **from** appointment **limit** 100;*



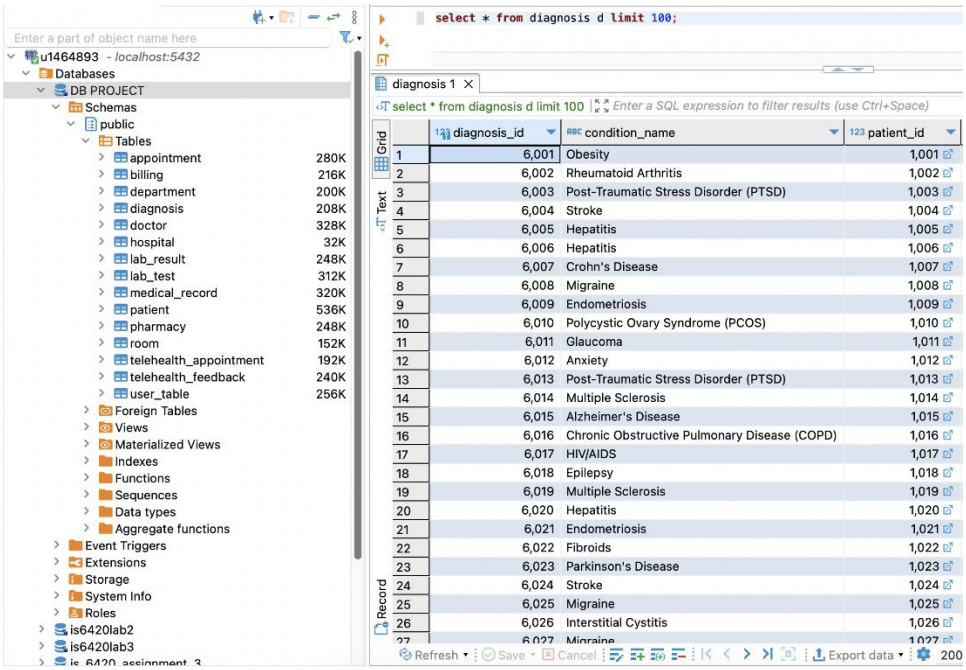
***select** * **from** billing **limit** 100;*



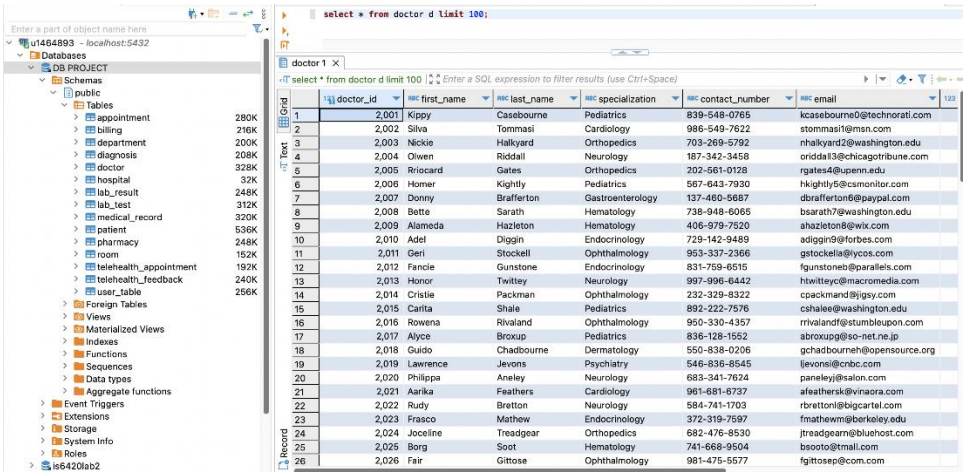
select * **from** department **limit** 100;



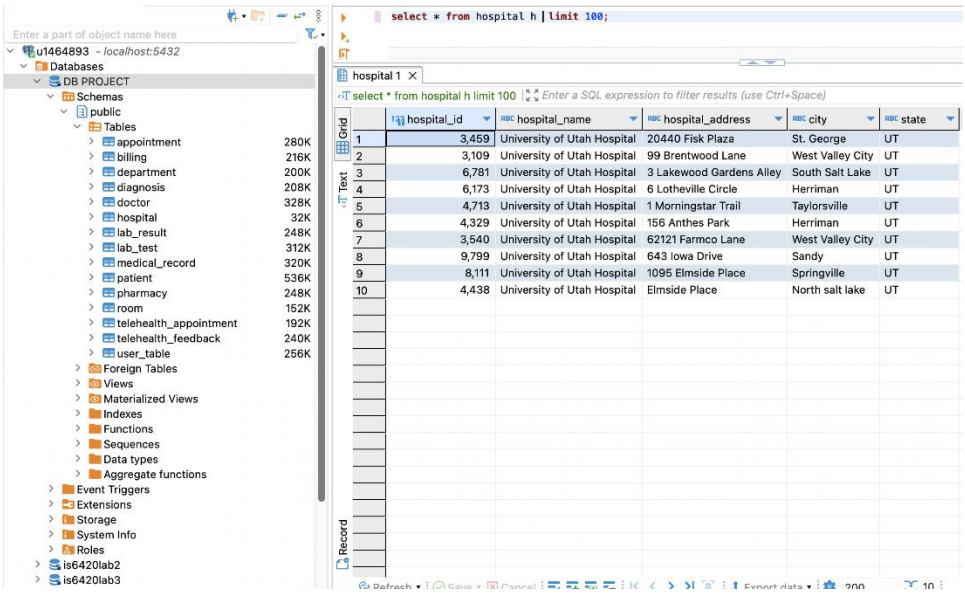
***select** * **from** diagnosis **limit** 100;*



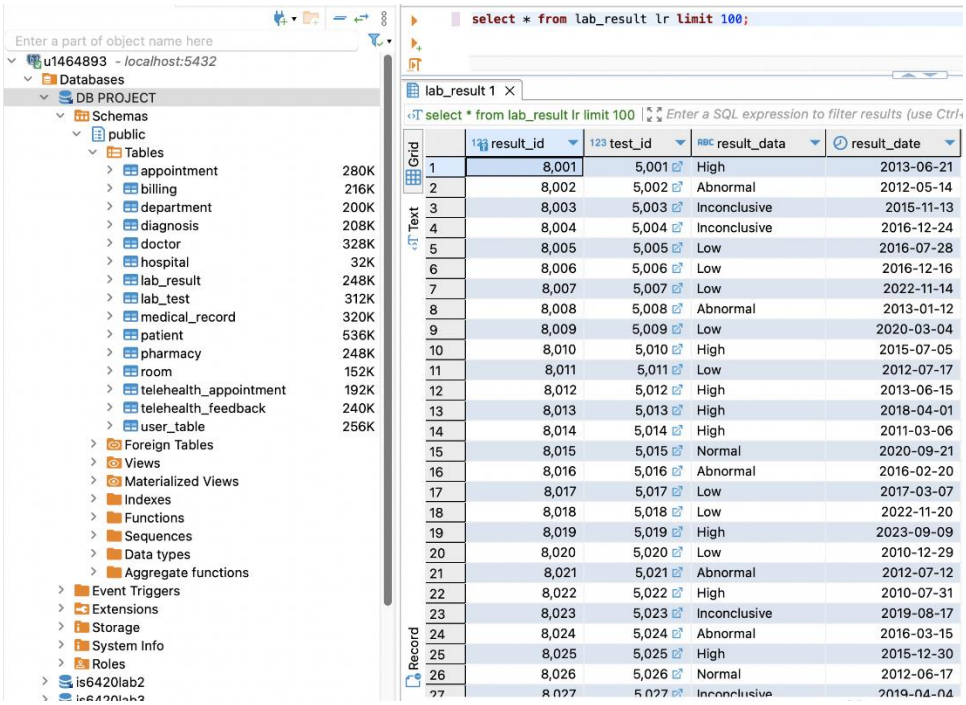
select * **from** doctor **limit** 100;



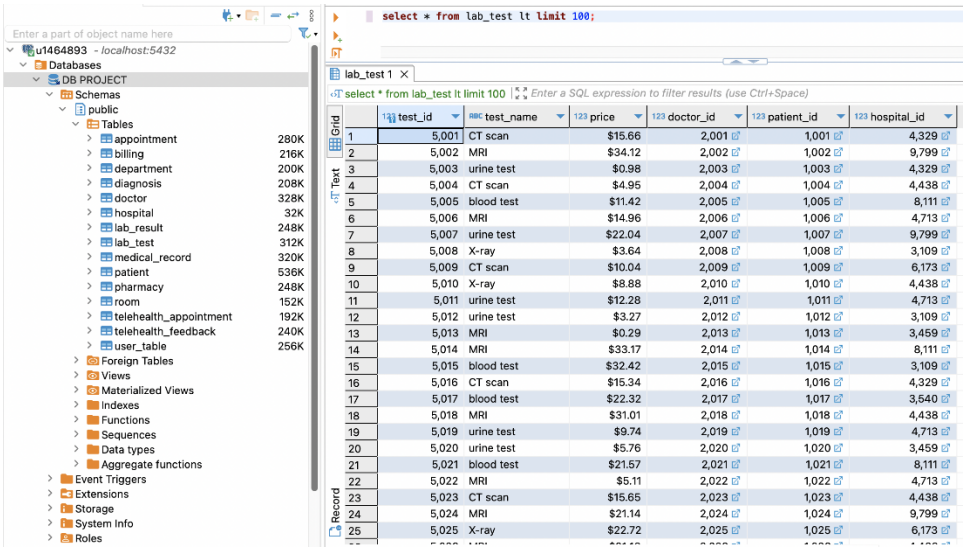
***select * from** hospital;*



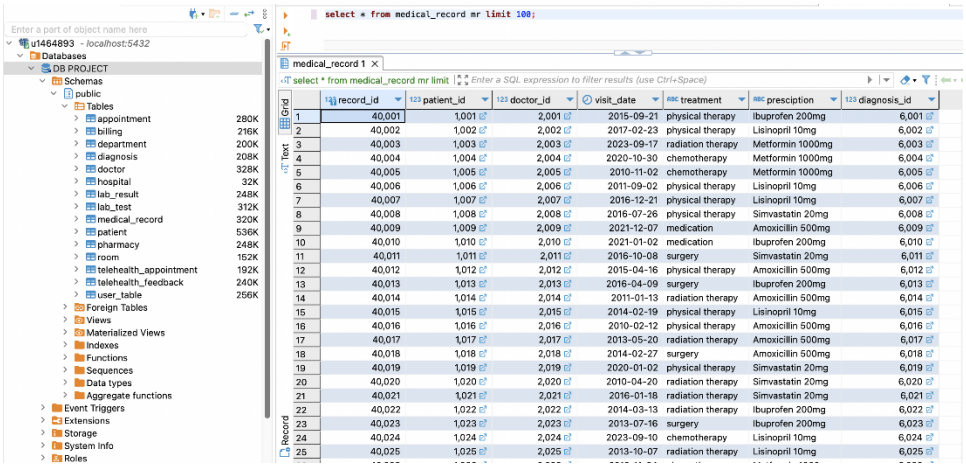
select * from lab_result limit 100;



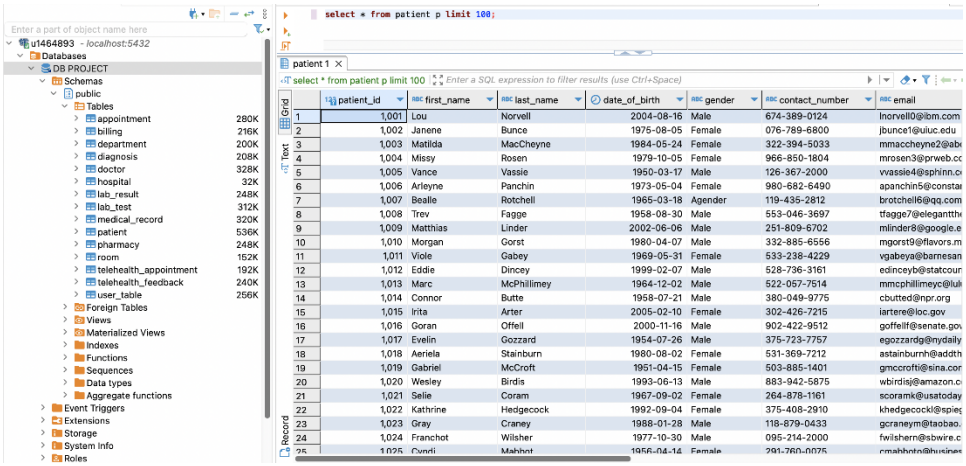
***select** * **from** lab_test **limit** 100;*



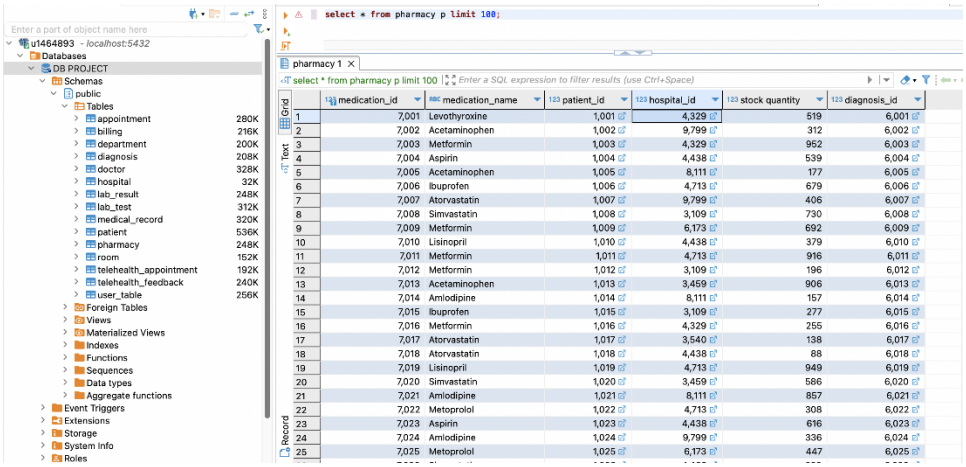
***select** * **from** medical_record **limit** 100;*



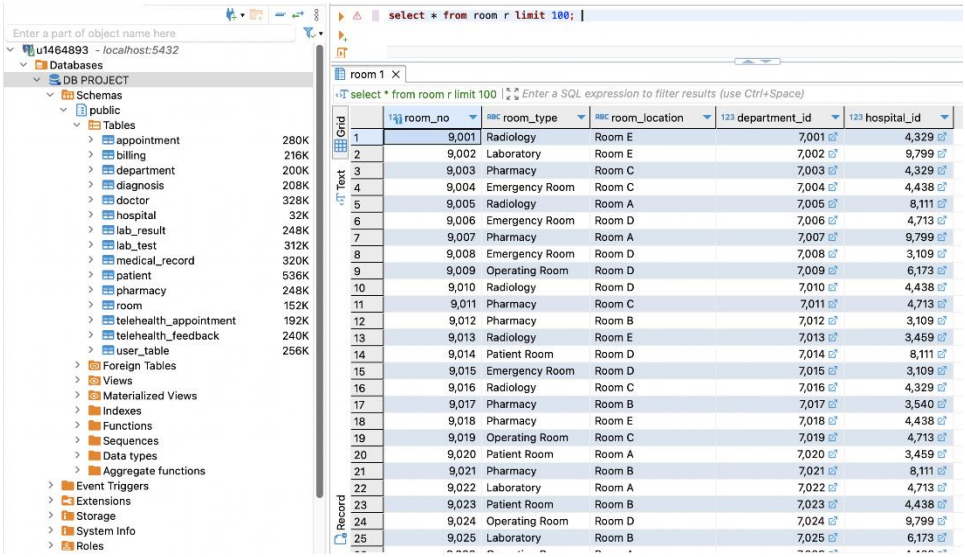
***select** * **from** patient **limit** 100;*



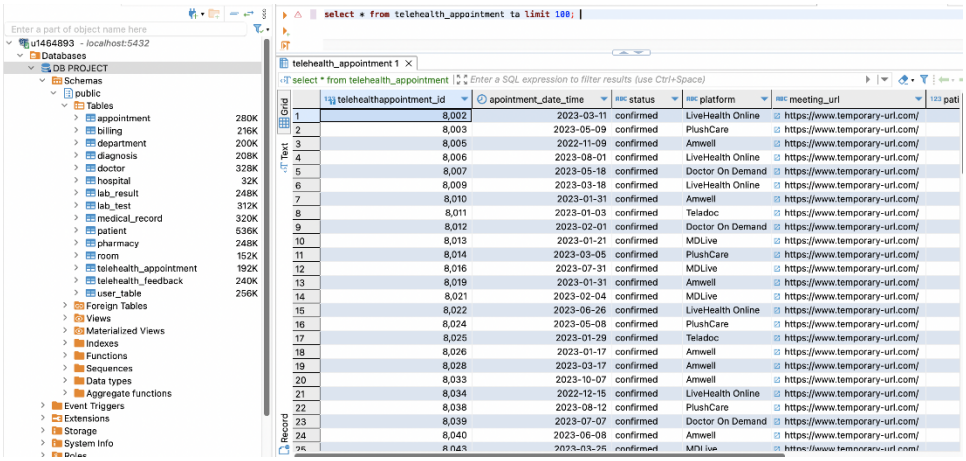
***select** * **from** pharmacy **limit** 100;*



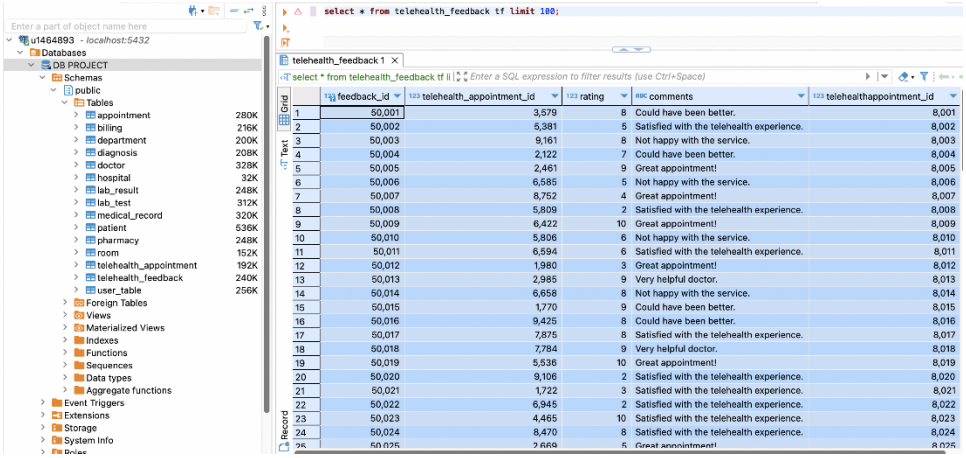
***select** * **from** room **limit** 100;*


Enter a part of object name here
u1464893 - localhost:5432
Databases
DB PROJECT
Schemas
public
Tables
appointment 280K
billing 216K
department 200K
diagnosis 208K
doctor 328K
hospital 32K
lab_result 248K
lab_test 312K
medical_record 320K
patient 536K
pharmacy 248K
room 152K
telehealth_appointment 192K
telehealth_feedback 240K
user_table 256K
Foreign Tables
Views
Materialized Views
Indexes
Functions
Sequences
Data types
Aggregate functions
Event Triggers
Extensions
Storage
System Info
Roles
select * from room r limit 100;
room 1
select * from room r limit 100
Enter a SQL expression to filter results (use Ctrl+Space)
Grid
Text
Record
room_no
room_type
room_location
department_id
hospital_id
1 9,001 Radiology Room E 7,001 4,329
2 9,002 Laboratory Room E 7,002 9,799
3 9,003 Pharmacy Room C 7,003 4,329
4 9,004 Emergency Room Room C 7,004 4,438
5 9,005 Radiology Room A 7,005 8,111
6 9,006 Emergency Room Room D 7,006 4,713
7 9,007 Pharmacy Room A 7,007 9,799
8 9,008 Emergency Room Room D 7,008 3,109
9 9,009 Operating Room Room D 7,009 6,173
10 9,010 Radiology Room D 7,010 4,438
11 9,011 Pharmacy Room C 7,011 4,713
12 9,012 Pharmacy Room B 7,012 3,109
13 9,013 Radiology Room E 7,013 3,459
14 9,014 Patient Room Room D 7,014 8,111
15 9,015 Emergency Room Room D 7,015 3,109
16 9,016 Radiology Room C 7,016 4,329
17 9,017 Pharmacy Room B 7,017 3,540
18 9,018 Pharmacy Room E 7,018 4,438
19 9,019 Operating Room Room C 7,019 4,713
20 9,020 Patient Room Room A 7,020 3,459
21 9,021 Pharmacy Room B 7,021 8,111
22 9,022 Laboratory Room A 7,022 4,713
23 9,023 Patient Room Room B 7,023 4,438
24 9,024 Operating Room Room D 7,024 9,799
25 9,025 Laboratory Room B 7,025 6,173

select * from telehealth_appointment limit 100;



***select * from** telehealth_feedback **limit** 100;*



***select * from** user_table **limit** 100;*