Clinic Database Project

Faculty of Computers and Artificial Intelligence

Database Systems Course

Project Report

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1. Introduction

This database project is designed for managing a clinic system. It supports storing and handling data for patients, doctors, appointments, departments, medical records, and invoices. The database was implemented in MySQL and follows relational database principles.

2. Tables Structure

- departments: departmentid (PK), departmentname
- doctors: doctorid (PK), doctorname, specialty, phone, departmentid (FK)
- patients: patientid (PK), patientname, gender, birthdate, phone
- appointments: appointmentid (PK), patientid (FK), doctorid (FK), appointmentdate, appointmenttime
- medicalrecords: recordid (PK), appointmentid (FK), diagnosis, prescription
- invoices: invoiceid (PK), appointmentid (FK), amount, paymentstatus

3. Relationships and Constraints

- Each doctor is linked to a department.
- Each appointment connects one patient with one doctor.
- Each appointment can have one medical record and one invoice.
- Foreign keys are used to maintain referential integrity.

4. Sample Data Inserted

Each table contains at least 10 entries.

- Departments: 10 entries (e.g., Cardiology, Neurology, etc.)
- Doctors: includes Dr. Abdallah Elnady (Cardiologist)
- Patients: 10 patients with different demographics
- Appointments: 10 appointments between patients and doctors
- Medical Records and Invoices: 10 each

5. SQL Features and Implementation

The SQL code includes:

- Table creation using primary and foreign keys
- Data types such as VARCHAR, DATE, TIME, and DECIMAL
- Insert statements with realistic clinic data
- JOINs to relate patients with doctors through appointments

6. Important SQL Queries

1. Search diagnoses containing 'flu':

```
SELECT patients.patientname, medicalrecords.diagnosis
FROM medicalrecords
JOIN appointments ON medicalrecords.appointmentid = appointments.appointmentid
JOIN patients ON appointments.patientid = patients.patientid
WHERE medicalrecords.diagnosis LIKE '%flu%';
```

2. List appointments newest first:

```
SELECT appointmentid, appointmentdate, appointmenttime
FROM appointments
ORDER BY appointmentdate DESC, appointmenttime DESC;
```

3. Patient and doctor details sorted A-Z:

```
SELECT patients.patientname, doctors.doctorname, appointments.appointmentdate
FROM appointments
JOIN patients ON appointments.patientid = patients.patientid
JOIN doctors ON appointments.doctorid = doctors.doctorid
ORDER BY doctors.doctorname ASC;
```

4. Count appointments per doctor:

```
SELECT doctors.doctorname, COUNT(appointments.appointmentid) AS total_appointments
FROM doctors
LEFT JOIN appointments ON doctors.doctorid = appointments.doctorid
GROUP BY doctors.doctorname
ORDER BY total_appointments DESC;
```

5. Total paid amount:

```
SELECT SUM(amount) AS total_paid
FROM invoices
WHERE paymentstatus = 'paid';
```

These queries demonstrate data retrieval, filtering with LIKE, sorting (ASC/DESC), counting, and summing values. This reflects real-world use cases in clinics.

7. Conclusion

This project helped understand how relational databases are designed and queried. By creating tables, inserting data, and performing complex queries, the system demonstrates the core functionalities of a medical clinic system.

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