Assignment specification

A report of maximum 15 pages (3500-5000 words).

Referencing: Any acceptable academic style.

You are expected to draw upon relevant readings from the course. Other readings and references are also allowed.

Please address the following questions (cases) in your submission.

1. Please read the scenario and address the following questions:

a. Identify the entities (also known as relations) that may be required for designing relational database for DentistX.

b. Identify and list attributes associated with the relations identified in a.

c. Identify Candidate keys, Primary Keys and Foreign keys.

d. Design a high-level ER model and define relations between entities.

e. Create an empty Database DentistX and Implement the Database according to the design presented in ER Model (d)

Note: Please make suitable assumptions for any missing requirements in the scenario.

2. Create at least 5 dummy records in each Primary Table and 10 dummy records in each detailed/child tables

3. Write SQL Queries to retrieve following data from your DentistX database.

a. Which Dentist treated the highest number of patients?

b. List number of appointments per month in order of the date and time they occurred.

c. Retrieve Patient details whose treatment(s) spanned over more than 3 appointments for each treatment.

d. Retrieve list of appointments where more than one junior/trainee dentists were assigned.

e. List number of treatments performed in each room.

f. Retrieve list of patients whose age is more than 40 years.

g. Calculate and present Total Hours used on each Patient in the database

4. Write a paragraph explaining your database design choices and explain why you think your database tables are in good normalized forms. Note: There is no need to present all steps of normalization while designing database itself.

5. Write a paragraph explaining your understanding of concurrency and isolation in Relational Databases.

6. Would It be a good idea to use NoSQL database instead of Relational Database for DentistX? Please provide your explanation using one or two paragraphs. You can also use examples as argument to prove your opinion.

Note: Please submit all your queries both DDL and DML.

Scenario for Questions 1-5 as follows:

DentistX is a hypothetical dental clinic in the heart of Gotham city. The clinic has 25 employees. The employees include 2 receptionists, 10 senior and 5 trainee dentists. There are also 8 hygienists working in the clinic. Every patient has to make an appointment before visiting the clinic. Receptionist takes the booking on mobile call and collects patient's personal details that include name, date of birth, address, contact nr, email address and short story about the issue with the teeth itself. Patient has provided personal Id number to make a booking.

Receptionist makes the booking on an excel sheet and depending on need of the patient assigns different resources. There are 7 treatment rooms in the clinic, and they are named alphabetically from Room A to Room G. Rooms can be booked for 2 hours interval at a time and intervals include following time slots only.

0900-1100

1200-1400

1500-1700

One treatment sometime spans over multiple appointment and some treatments are completed in just on appointment. Clinic always charges per appointment session. There is variable price for each treatment that receptionist decides while making first booking. The price mostly is adjusted after first appointment as that is when first diagnosis happens.

DentistX wants to stop using Excel sheets as that is causing lots of delays and inconsistencies which is resulting in unhappy patients. Management has decided to digitize the clinic. As one of the first steps a high-level relational database model needs to be designed.

DentistX has outlined following business rules.

One patient can be assigned maximum one senior dentist.

If patient wants to get the hygienic control only then one hygienist and a trainee dentist can be assigned to the patient.

If patient is interested in hygienic control as well as one or more dentist treatments then a senior dentist, a trainee and a hygienist is assigned to one booking. There can however be need to assign multiple junior/trainee dentists to one appointment.