Project PART 2

Dr. Hope Smilow is very pleased with the progress your team is making and with your initial proposal for her DB. Now it is the time to solidify the logical design of your database and to think how you are going to create queries to help her with information retrieval and making use of the data in her DB.

1. Review feedback provided for your initial design from PART 1 and make necessary changes. Your (E)ERD should be fully correct and ready to be mapped into the schema. **Remember, if you start with an even partially incorrect diagram and create a model based on that, you will not have a working DB and all your work from this point forward may be faulty. It is extremely important to have a fully correct ERD before starting schema development.**
2. Using sentence notation learned in class, map your (E)ER diagram to a relational schema. Indicate all primary and foreign keys and show how they relate to each other. Make sure that you properly follow the mapping algorithm and evaluate and map each element shown in your ERD. Your relational schema must be fully consistent with your ERD. Show and explain all the steps you take in the process. Carefully review primary keys and relations/attribute names and make changes if necessary. Use your best judgement when mapping specializations and try to avoid NULLs.
3. Given your relational schema, provide the relational algebra to perform the following queries. If your schema cannot provide answers to these queries, revise your ER Model and your relational schema to contain/supply the appropriate information for these queries. Double check that all required information can be calculated by using RA and you do not store or utilize derived attributes.

a. Create a list of patients and the medications they currently take
b. Display patient information for patients who currently have Delta Dental insurance policy.
c. Generate a list of procedures and dates of service performed by doctor Smilow.
d. Print out a list of past due invoices with patient contact information. Past due is defined as over 30 days old with a balance over $10.
e. Find the patients who brought the most revenue in the past year.
f. Create a list of doctors who performed less than 5 procedures this year.
g. Find the highest paying procedures, procedure price, and the total number of those procedures performed.
h. Create a list of all payment types accepted, number of times each of them was used, and total amount charged to that type of payment.
i. List ids and names of insurance plans ever used by patients and how many patients have that plan.

4. Provide three additional interesting queries in plain English and relational algebra. Each of your queries should include at least one of these. Queries should be interesting and involve multiple entities and operations.

a. outer joins
b. aggregate function
c. "extra" entities from PART 1

5. Now we are almost ready to implement our DB in RDBMS (SQL). Before we can do this, you need to complete specification sheets for each relation (metadata). This information would be passed to the programmers and used to create SQL code. List all your proposed relations. They are about to become DB tables. For each table, describe its purpose. List all attributes. For each attribute specify constraints (NULL, semantic, length, proposed data type, etc.) For FKs, identify matching relations and PKs and specify any relevant referential integrity rules. **Do NOT include any parts of actual SQL code here. This documentation should be language independent.**

6. **List all team member contributions.** Provide any relevant details on how your team has been functioning.
7. Submit a professionally written and well formatted report showing **ALL** your work. **Include your original ERD and feedback from PART 1.** Do not submit separate files or links. All work must be fully included in one report. When inserting images, make sure that they are in high resolution and easily readable. Failure to do this will result in loss of points. Resubmissions or additions to the submitted report will not be accepted.
8. Save all your work as you will need to use it for the next phase of the project. Each team member should retain copies of all completed work.