CS/SE 4347

Project Description

Goal – To create a data model and the associated database for a scoped organization or business. Approach the project as if your team has funding for an initial concept phase and will have a chance to demo for more funding. Teams of up to 5 students is allowed.

Project Teams: Use the discussion board forum to create your project teams (due by February 1st). Post a thread if you are looking for a team member. Update the thread once you find a team. You can also use Discord or MS Teams to create your project teams. It is highly recommended that one team member take on the role of coordinator. Complete Project special homework by Tuesday, February 6th.

The project is made up of the following phases:

Project Proposal (5%)

- This is a write up of the "mini-world" that is the scope of your database project. The mini-world can be anything – examples include: a business offering space travel, a business for coding camps, an art gallery, or a non-profit for a food delivery service. Have fun with it! The Project Proposal will be written for a ***non-engineering*** audience and must have the following:
- Problem Domain and Solution – business description and business rules at the complexity level of the Hospital example on the last page of this document. Provide a full narrative of your mini-world.
- Identify major entity types - For each entity type describe what is it, what does it do in the mini-world, how does it interact with other major entity types?
- Assumptions on how many tables and relationships will be discovered.
- Assumptions on volumes of data: for example, we estimate treating 2,000 patients each year, and employing 400 nurses a year.
- Summary of what your project will achieve or what you will provide to eventual users of the database.
- The name of DBMS (PostgreSQL, Oracle, MySQL etc.) your team will be using for the project.

Submission:

- Submit proposal document via eLearning in **pdf** format, only one submission per team.

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- Please name the file as 4347ProjectProposal_Team# (last names of team members, Example: 4347ProjectProposal_Team10).
- The names of everyone who participated in this project assignment and what they did on cover page (If someone does not contribute they will receive a 0 on this part.)
- Maximum 5 pages single spaced
- Due Thursday, February 15th

Part 1 – Data Model and Schema (7%)

- Include a copy of your proposal - with any updates since approval marked in red. It is expected that some changes have to be made as the project progresses.
- Entity Relationship Diagram (ERD)
- Supporting Schema Diagram
- Data Dictionary for the Schema with each table, table description, primary key, super keys, foreign keys, each attribute with data types and domains (as shown below).

Table	Table Description	Primary Key	SuperKey	Attributes	Foreign Key
User	A person that has an account with our application.	Username	(Username, Playlist IDs, Subscription ID, Credit Card, Purchased, Applied, Password)	Attribute / Data Type / Domain: Username / VARCHAR / Any string	Subscription ID, Playlist IDs, Credit Card, Purchased, Applied

- The names of the tool(s) used for the ERD and the schema diagram.

Submission:

- Submit project part1 document via eLearning in **pdf** format, only one submission per team.
- Name your submission as 4347ProjectPart1_Team# (as before).
- The names of everyone who participated in this project assignment and what they did on cover page (as before).
- Maximum 10 pages single spaced
- Due Thursday, March 7th

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Part 2 – Database and SQL (12%)

- Current ERD, schema diagram, and schema data dictionary with any changes noted in red.
- Screen shot of the Database tool work area (screenshot of the area where commands are entered through sql commands)
- Very specific screen shots of how the tool supports SQL: (screenshot of the SQL commands as they are being executed in MySQL workbench for your project)
    - CREATE
    - SELECT
    - INSERT
    - DELETE
    - UPDATE
    - DROP
- Implementation Log – either generated by MySQL or handwritten notes – the log must show the dates and times of the creation of all tables, columns, keys, and updates to the database schema (include only *schema* related changes otherwise log file gets very large).
- Data Generation
    - Populate the database with meaningful data – data that supports the business rules – there are 2 steps to this:
        1. Estimate the number of rows/tuples for each table
        2. Enter the data – using scripts or other code or manually
    - Turn in a list showing each table and its planned size – be realistic - consider the relationships. For example, how many operations can be held in a year, then how many doctors, techs, and nurses working in those rooms are needed per year?
    - Turn in a list showing one row/tuple from *each table* with data
- Query Examples – turn in queries for the following:
  Execute the query examples in the database tool work area and include screenshots.
    1. Show a count of the largest population – example - How many patients are in the hospital
    2. Show a listing of a key entity in the database – example – Who are the doctors in the hospital?
    3. Show a list of entities that must function together – example – Show all the doctors and technicians who work together (a join)
    4. Show the cost of an occurrence, derived using aggregate functions – example – How much will a hospital stay cost a

patient - consider the doctor, nurse, technician, room, and insurance

5. Show a schedule for multiple occurrences, sorted by date and time – example – what is the schedule for an operating room for a specific week?

Submission:

- Submit project part2 document via eLearning in **pdf** format, only one submission per team.
- Name your submission as 4347ProjectPart2_Team# (as before).
- The names of everyone who participated in this project assignment and what they did on cover page (as before).
- Maximum 20 pages single spaced
- Due Thursday, May 2nd

Project Demos (6%) – April 25th, April 30th, May 2nd

- Each team will create a powerpoint presentation and demo their project.
- Approach the presentation as if you are demonstrating to investors for the next level of funding.
- Seven to ten minute time limit.
- You can present using your own devices.
- Each member of the team should present some portion of the project per the team's discretion.
- The presentation will include
  - Overview of the business
  - Overview of the data model
  - Demonstration of the database, where you are with the project
  - ***Extra points can be earned by the teams that create a customized functional (not a mockup) demo interface*** – will be judged on usability and look and feel

Submission:

- Submit presentation via eLearning, only one submission per team.
- Name your submission 4347ProjectPresentation_Team# (as before).
- The names of everyone who participated in this project assignment and what they did on cover page (as before).
- Due Thursday, May 2nd

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HealthCare Hospital Example

There is one HealthCare Hospital. The scope of this example includes patients, healthcare providers, and facilities. Out of scope are a day clinic, the morgue, the pharmacy, food services, and no changing of rooms/beds.

Business Rules

1. Each patient must have a name, a phone number, an address, and insurance. A patient may have a condition to be treated, a next of kin, and a living will.

2. The condition to be treated can have a length of time for a surgical procedure, the cost, and the specialty of the surgeon

3. Each insurance company is represented by an agent, each plan has a deductible, and a plan maximum allowance

4. Each surgeon will have a name, office address, and other information about their practice

5. Each technician will have information on their specialties, a name, cost and time for a surgical procedure

6. Each nurse will have a specialty, a name, a rank, and assignment.

7. The hospital will consist of wards, operating rooms, and recovery rooms.

8. Each ward is made up of patient rooms

9. Each patient room has a daily price, a room number, and the start date and end date of a patient's stay

10. The hospital has multiple operating rooms, each operating room has a schedule. This schedule coordinates operating room with surgeon, nurse, technician, and patient.

11. Each recovery room will serve a patient recovering from surgery and has the start date and time and the end date and time of patient's stay.