Assignment 1

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Introduction to Database and the Relational Model

- Read chapter 1 that introduces you to client-server and web-based systems, the relational data model that organizes data into related tables, and to SQL the language used to search and update relational table data.

- Install Bitnami WAMP or MAMP bundle. This give you Apache web server, Php and MySQL.

- Install MySQL Workbench.

- Install sample databases by going to www.murach.com and downloading the zip file that accompanies "murch's mysql edition 2". Unzip. Open the sql script create_databases.sql and execute it using MySQL Workbench. This will create sample databases "ap", "ex" and "om".

- Read chapter 2 to familarize yourself with MySQL Workbench

Answer the following questions from chapter 1 and upload either a Word docx or PDF file with your answers to Assignment 1.

1. Describe briefly the different systems involved in a simple web-based system?
    a. A typical web system these days will include 3 separate pieces of software; a webserver, apache or nginx are most common, some form of a SQL server, ex. MySQL and MariaDB, and then PHP for server side scripting of web pages. The webserver is the part that will actually handle the HTTP requests and returning of the HTML for the client's browser to view. SQL is a database backend that can be used to store any information that the site needs. PHP is a server side scripting language that allows you to process data using an OOP like language, and generate HTML on the fly for the user to see.

2. Explain the terms **relation (also called table)**, **tuple (also called row)** and **attribute (also called column)**.
    a. A relation in a database contains vertical columns and horizontal rows. These columns and rows contain the information that is stored in the table.
    b. A tuple contains a single item from the database table. Every row in a table will be structured the same way, and contains related data.

c. The columns in a database are what provide the structure that is in the table, and are used to organized the data that is stored in the rows. Each column will contain a single type of data in it.

3. Give an example of a relational table with a primary key (other than the examples in the textbook).
    a. A student information system that is used to track what students are enrolled, what classes they have taken, and whether the have paid all their fees to be able to continue taking class.

4. What is a **foreign key**? Give an example of a table with a foreign key (other than examples in the textbook).

    a. A foreign key is a unique identifier that can be used to find data in another table.
    b. A foreign key in a student information system would be a student ID number. No student will have the same ID number, so it is unique to each student.

5. An **auto generated key** is sometimes referred to as a **surrogate key**? Under what circumstances would you use one?
    a. A possible use case for an auto generated key would be when you have a web application that requires users to sign up. When the user fills out there information and their information is entered into the database, you could use an auto generated key that is incremented when each new user signs up.

6. Explain three possible usages of a null value.
    a. Value is unknown, unavailable, or not applicable

7. What are DML statements and how are they different from DDL statements?
    a. A DML statement is a statement that is used to modify the data that is stored in a database. These are the kinds of statements that an application developer will mostly be working with.
    b. A DDL statement is a statement that is used to manage the database objects itself. These are statements that would be used to create the tables, the schema, and the structure of the database. These statements will mostly be used by a DBA and not a developer of an application.