Exercise

CSC230 Database Technologies for Analytics

19 October 2021

1. We will learn how create and use relational databases. This technology dates from which decade?

   - 1940s
   - 1950s
   - 1960s
   - 1970s
   - 1980s

2. Mathematicians and computer scientists sometimes prefer different words to name the same things.

   Put the synonyms in the following list together in groups.

   Identify the words in each group that the mathematicians favor and those that the computer scientists favor.

   - attribute
   - column
   - domain
   - record
   - relation
   - row
   - table
   - tuple
   - type

3. Computer scientists have adopted a convention that represents databases with which shape?

   - triangle
   - rectangle

- box
- cylinder
- sphere

4. There are many reasons why we might choose a database management system rather than a spreadsheet to store our data.

   What is one of these reasons?

5. A subset of SQL is a DDL.

   (a) What is a DDL?
   (b) What is an example of a SQL command that belongs to this part of the language?

6. A subset of SQL is a DML.

   (a) What is a DML?
   (b) What is an example of a SQL command that belongs to this part of the language?

7. How might you use underscores in names of tables and columns? For what purpose?

8. Will SQL allow us to write commands with upper case letters?

9. Will SQL allows us to write the names of tables and columns with lower case letters?

10. Is there any reason to prefer upper case letters some of the time and lower case letters for other uses in our SQL scripts?

11. Look through the examples you seen thus far.

    (a) Where are we using commas in our SQL commands?
    (b) Where are we using single quotation marks in our SQL commands?
    (c) Where are we using semicolons in our SQL commands?

12. Search on the Web for a list of the data types that the MySQL RDBMS allows. The W3Schools website is a good place to look.

    (a) What are some of the choices available to use if we indicate that column will hold numbers that could have fractional part?
    (b) Why might you prefer one alternative over another?—you will have to work a little harder to find the answer to this question.
    (c) (For students who have made computer science their major course of study.) What is IEEE 754? How might an understanding of this standard help us answer the other parts of this question?

13. Find a description of MySQL's support for Unicode in the *MySQL Reference Manual*.

    If we use the UTF-8 format, we can store text written in which languages in a MySQL database?

14. These two SQL statements will show us different information. Explain.

    DESC my_contacts;

    SELECT * FROM my_contacts;

15. Here is a SQL script that creates a database that describes several famous ships.

```
# This is one kind of comment.

–– This is another kind of comment.

/*
  This is yet another kind of comment.
  This kind of comment can be more than
  one line long.
*/

DROP DATABASE IF EXISTS clippers;

CREATE DATABASE clippers;

USE clippers;

/*
   Use backticks (like a single quotation mark
   that leans to the left) to enclose names
   of tables and columns.
*/

CREATE TABLE `ships` (
   `index` INTEGER PRIMARY KEY,
   `name` VARCHAR(12) NOT NULL,
   `nation` VARCHAR(24) NOT NULL,
   `year` INTEGER NOT NULL,
```

```
    'length' INTEGER NOT NULL );

/*
  Use single quotation marks to enclose
  strings that we are storing in the database.
*/

INSERT INTO 'ships'
      ('index', 'name', 'nation', 'year', 'length') VALUES
  (1, 'Ariel', 'United Kingdom', 1865, 197 ),
  (2, 'Cutty Sark', 'United Kingdom', 1869, 280 ),
  (3, 'Flying Cloud', 'United States', 1851, 225 ),
  (4, 'Red Jacket', 'United States', 1853, 251 );

-- Let's see what we've got!

DESC ships;

SELECT * FROM ships;

-- I didn't need single quotes or backticks!
```

Compose a similar script that creates a database that describes several mountains.

You will have to find information about mountains. You will have to decide what kind of information about the mountains to include in your database.