Database Admin 101 - Lab

Introduction

In this lab, you'll go through the process of designing and creating a database. From there, you'll begin to populate this table with mock data provided to you.

Objectives

You will be able to:

- Use knowledge of the structure of databases to create a database and populate it

The Scenario

You are looking to design a database for a school that will house various information from student grades to contact information, class roster lists and attendance. First, think of how you would design such a database. What tables would you include? What columns would each table have? What would be the primary means to join said tables?

Creating the Database

Now that you've put a little thought into how you might design your database, it's time to go ahead and create it! Start by import the necessary packages. Then, create a database called **school.sqlite**.

```
# Import necessary packages
import sqlite3
import pandas as pd
```

```
# Create the database school.sqlite
conn = sqlite3.Connection('school.sqlite')
```

Create a Table for Contact Information

Create a table called contactInfo to house contact information for both students and staff. Be sure to include columns for first name, last name, role (student/staff), telephone number, street, city, state, and zipcode. Be sure to also create a primary key for the table.

```
cur = conn.cursor()
cur.execute("""CREATE TABLE contactInfo (
                                        userId INTEGER PRIMARY KEY,
                                        firstName TEXT,
                                        lastName TEXT,
                                        role TEXT,
                                        telephone INTEGER,
                                        street TEXT,
                                        city TEXT,
                                        state TEXT,
                                        zipcode TEXT
                                        );
            """)
```

```
<sqlite3.Cursor at 0x11c60e340>
```

Populate the Table

Below, code is provided for you in order to load a list of dictionaries. Briefly examine the list. Each dictionary in the list will serve as an entry for your contact info table. Once you've briefly investigated the structure of this data, write a for loop to iterate through the list and create an entry in your table for each person's contact info.

```
# Load the list of dictionaries; just run this cell
import pickle

with open('contact_list.pickle', 'rb') as f:
    contacts = pickle.load(f)
```

```
# Iterate over the contact list and populate the contactInfo table here
for contact in contacts:
    firstName = contact['firstName']
    lastName = contact['lastName']
    role = contact['role']
    telephone  = contact['telephone ']
    street = contact['street']
    city = contact['city']
    state = contact['state']
    zipcode  = contact['zipcode ']
    cur.execute("""INSERT INTO contactInfo (firstName, lastName, role, telephone, st
                   VALUES ('{}', '{}', '{}', '{}', '{}', '{}', '{}', '{}');
                """.format(firstName, lastName, role, telephone, street, city, state
```

Query the Table to Ensure it is populated

```
cur.execute("""SELECT *
               FROM contactInfo;""")
df = pd.DataFrame(cur.fetchall())
df.columns = [x[0] for x in cur.description]
df
```

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	userId	firstName	lastName	role	telephone	street	
0	1	Christine	Holden	staff	2035687697	1672 Whitman Court	Sta
1	2	Christopher	Warren	student	2175150957	1935 University Hill Road	Ch
2	3	Linda	Jacobson	staff	4049446441	479 Musgrave Street	Atl
3	4	Andrew	Stepp	student	7866419252	2981 Lamberts Branch Road	Hia
4	5	Jane	Evans	student	3259909290	1461 Briarhill Lane	Ab
5	6	Jane	Evans	student	3259909290	1461 Briarhill Lane	Ab
6	7	Mary	Raines	student	9075772295	3975 Jerry Toth Drive	Nir
7	8	Ed	Lyman	student	5179695576	3478 Be Sreet	Lar

Commit Your Changes to the Database

Persist your changes by committing them to the database.

```
conn.commit()
```

Create a Table for Student Grades

Create a new table in the database called "grades". In the table, include the following fields: userId, courseId, grade.

** This problem is a bit more tricky and will require a dual key. (A nuance you have yet to see.) Here's how to do that:

```
CREATE TABLE table_name(
   column_1 INTEGER NOT NULL,
   column_2 INTEGER NOT NULL,
   ...
   PRIMARY KEY(column_1,column_2,...)
);
```

```
# Create the grades table
cur.execute("""CREATE TABLE grades (
                                    userId INTEGER NOT NULL,
                                    courseId INTEGER NOT NULL,
                                    grade INTEGER,
                                    PRIMARY KEY(userId, courseId)
                                    );
            """)
```

```
<sqlite3.Cursor at 0x11c60e340>
```

Remove Duplicate Entries

An analyst just realized that there is a duplicate entry in the contactInfo table! Find and remove it.

```
# Find the duplicate entry
cur.execute("""SELECT firstName, lastName, telephone, COUNT(*)
               FROM contactInfo
               GROUP BY firstName, lastName, telephone
               HAVING COUNT(*) > 1;""").fetchall()
```

```
[('Jane', 'Evans', 3259909290, 2)]
```

```
# Delete the duplicate entry
cur.execute("""DELETE FROM contactInfo
               WHERE telephone = 3259909290;""")
```

```
<sqlite3.Cursor at 0x11c60e340>
```

```
# Check that the duplicate entry was removed
cur.execute("""SELECT firstName, lastName, telephone, COUNT(*)
               FROM contactInfo
               GROUP BY firstName, lastName, telephone
               HAVING COUNT(*) > 1;""").fetchall()
```

```
[]
```

Updating an Address

Ed Lyman just moved to `2910 Simpson Avenue York, PA 17403`. Update his address accordingly.

```
# Update Ed's address
cur.execute("""UPDATE contactInfo
               SET street = "2910 Simpson Avenue",
                   city = 'York',
                   state = 'PA',
                   zipcode = '17403'
               WHERE firstName = "Ed" AND lastName = "Lyman";""")
```

```
<sqlite3.Cursor at 0x11c60e340>
```

```
# Query the database to ensure the change was made
cur.execute("""SELECT *
               FROM contactInfo;""")
df = pd.DataFrame(cur.fetchall())
```

```
df.columns = [x[0] for x in cur.description]
df
```

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4	7	Mary	Raines	student	9075772295	3975 Jerry Toth Drive	Nir
5	8	Ed	Lyman	student	5179695576	2910 Simpson Avenue	Yor

Commit Your Changes to the Database

Once again, persist your changes by committing them to the database.

```
conn.commit()
```

Summary

While there's certainly more to do with setting up and managing this database, you got a taste for creating, populating, and maintaining databases! Feel free to continue fleshing out this exercise for more practice.

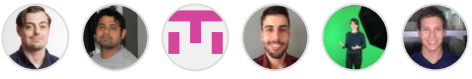
Releases

No releases published

Packages

No packages published

Contributors 6



Languages

- **Jupyter Notebook** 100.0%