



MAPÚA UNIVERSITY

SCHOOL OF ELECTRICAL, ELECTRONICS, AND COMPUTER ENGINEERING

Experiment 5: Data Modeling and Database Systems

CPE106L (Software Design Laboratory)

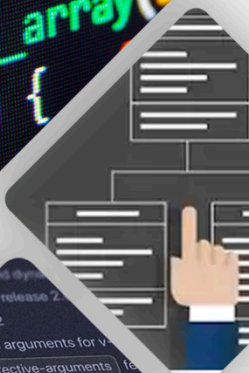
Member 1 (Cromuel Pangilinan)

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**Group No.: 9
Section: B3**



Readings, Insights, and Reflection

A Guide to SQL.
Philip J. Pratt; et al. 9780357419830
Chapters 1 & 2

Core Python Programming.
R. Nageswara Rao. 9789351198918
Chapter 24

Python Projects.
Laura Cassell. 9781118908891
Chapter 3

- Torres, Nicole Allyson B.
 - A Guide to SQL - Chapters 1 & 2 and Core Python Programming - Chapter 24
 - "A Guide to SQL" by Philip J. Pratt et al. is an excellent book that takes a deep dive into the core concepts of databases, emphasizing the significance of comprehending databases' nature and design principles. The book offers a practical approach, using real-world examples from various industries to provide a comprehensive understanding of the unique database requirements faced by different organizations. It covers multiple topics, such as database normalization, data modeling, and design fundamentals, highlighting the significance of creating efficient and precise database structures. The book's practical approach, illustrated with real-world examples, makes it an excellent guide for professionals seeking to develop reliable data processing systems and make informed decisions in modern information systems.
 - Chapter 24 of the book "Core Python Programming" by R. Nageswara Rao provides a detailed guide on advanced programming principles in Python. The chapter mainly focuses on threading and multiprocessing and explains their similarities and differences. It also covers the threading module, which offers an effective way of creating and managing threads. The chapter also explains synchronization techniques such as locks, semaphores, and condition variables that help prevent race conditions in multithreaded programs. Moreover, the chapter delves into multiprocessing and utilizes the multiprocessing module to demonstrate how to use multiple CPU cores for parallel processing tasks. In summary, this chapter offers valuable insights into concurrent programming paradigms in Python, enabling readers to create efficient and scalable applications.

Answer to Questions:

Short Answer:

1. What are DML and DDL statements in Structured Query Language? Give examples of each.

DML (Data Manipulation Language) is the language used to modify data stored in a database. It includes frequently used commands like select, insert, delete, and update. However, DDL (Data Definition Language) manages and structures the database by creating, altering, and deleting objects.

2. What are the categories of SQLite Functions? Give 3 examples of each category.

SQLite is divided into three main categories of functions: mathematical, string, and date/time. The mathematical functions include ABS(), ROUND(), and SIN(). The string functions include LENGTH(), UPPER(), and SUBSTR(). Finally, the date and time functions include CURRENT_DATE, DATE(), and STRFTIME(). These are the most commonly used functions essential for working with SQLite.

3. How do you check if you have SQLite installed in system using the Linux terminal.

To determine whether SQLite is installed on your Linux system, you can use the command-line interface and type 'sqlite3 --version' in the terminal. If the SQLite is installed, the terminal will display the version of the installed SQLite. This can be useful in verifying that you have the correct version of SQLite installed or in troubleshooting issues related to SQLite installation.

InLab

Objectives .

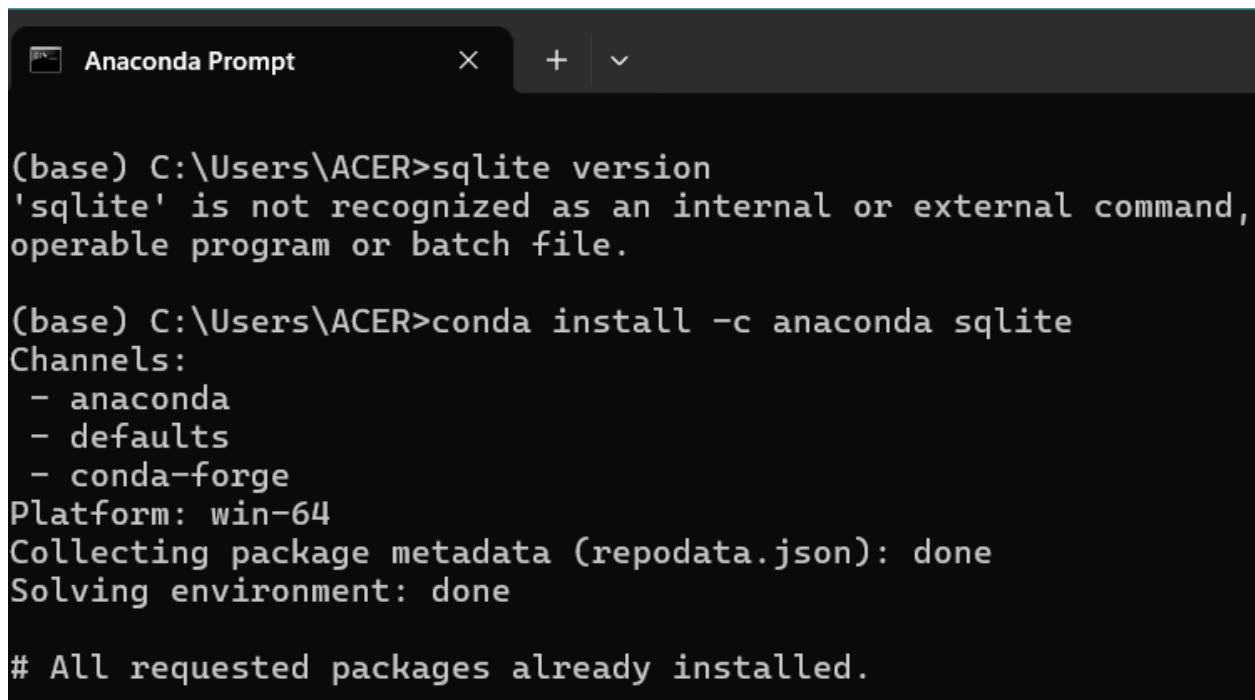
1. Create and modify tables for the database.
2. Using DB Browser for SQLite
3. Check if SQLite is installed in the system using the Linux terminal.

● Tools Used

- Anaconda
- Microsoft Visual Studio Code 2022
- DB Browser for SQLite

● Procedure.

1. We install SQLite on our laptop/computer by using the command “conda install -c anaconda sqlite” in the Anaconda terminal to install it.



```
Anaconda Prompt  X  +  v

(base) C:\Users\ACER>sqlite version
'sqlite' is not recognized as an internal or external command,
operable program or batch file.

(base) C:\Users\ACER>conda install -c anaconda sqlite
Channels:
- anaconda
- defaults
- conda-forge
Platform: win-64
Collecting package metadata (repodata.json): done
Solving environment: done

# All requested packages already installed.
```

Figure 1: Installing SQLite using Anaconda Terminal.

2. Opening the chinook database on the DB browser for SQLite.

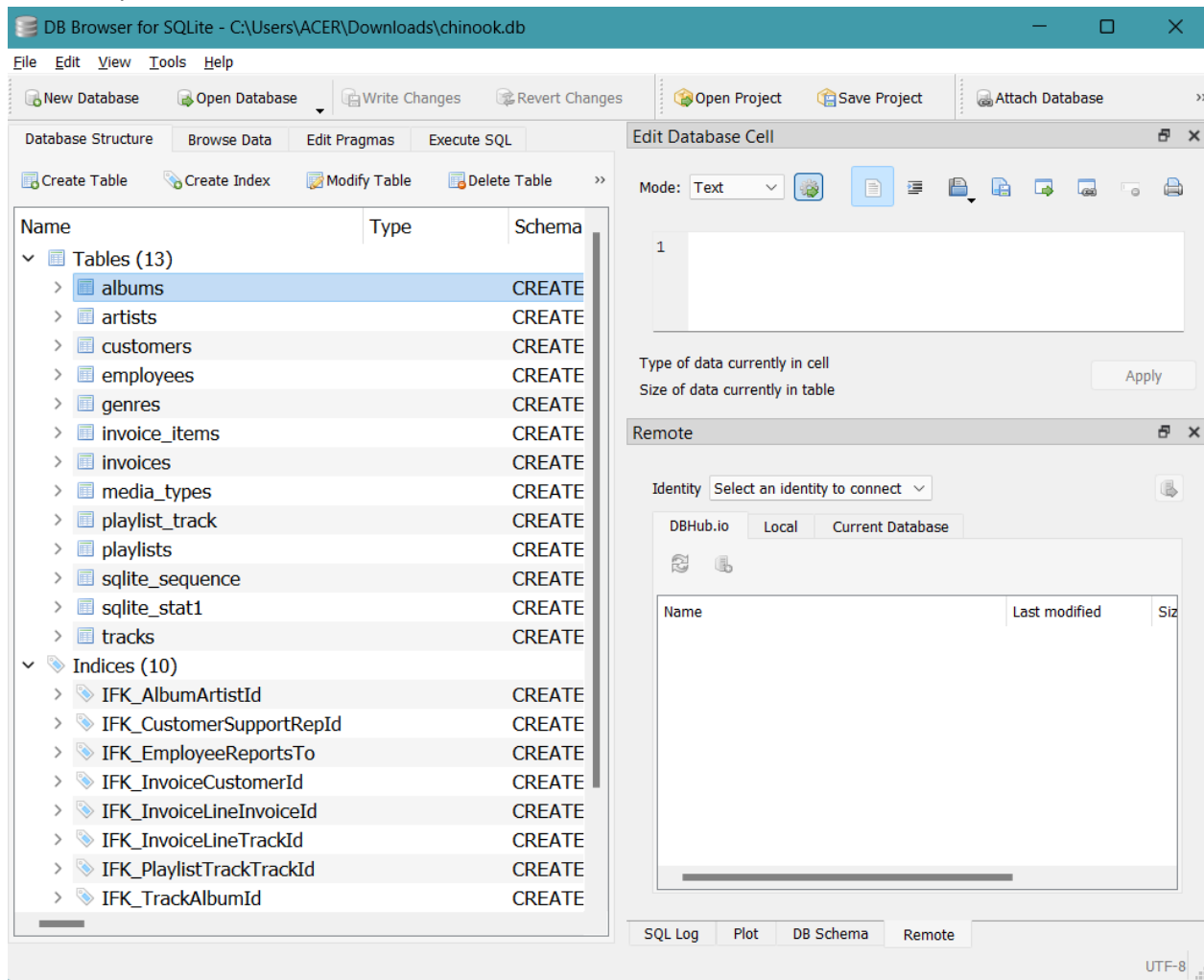


Figure 2: Chinook Database in DB Browser for SQLite.

- Opening the DB Browser, then we opened a database and executed SQL. Using the command 'SELECT * FROM employees', we could access the table named 'employees'.

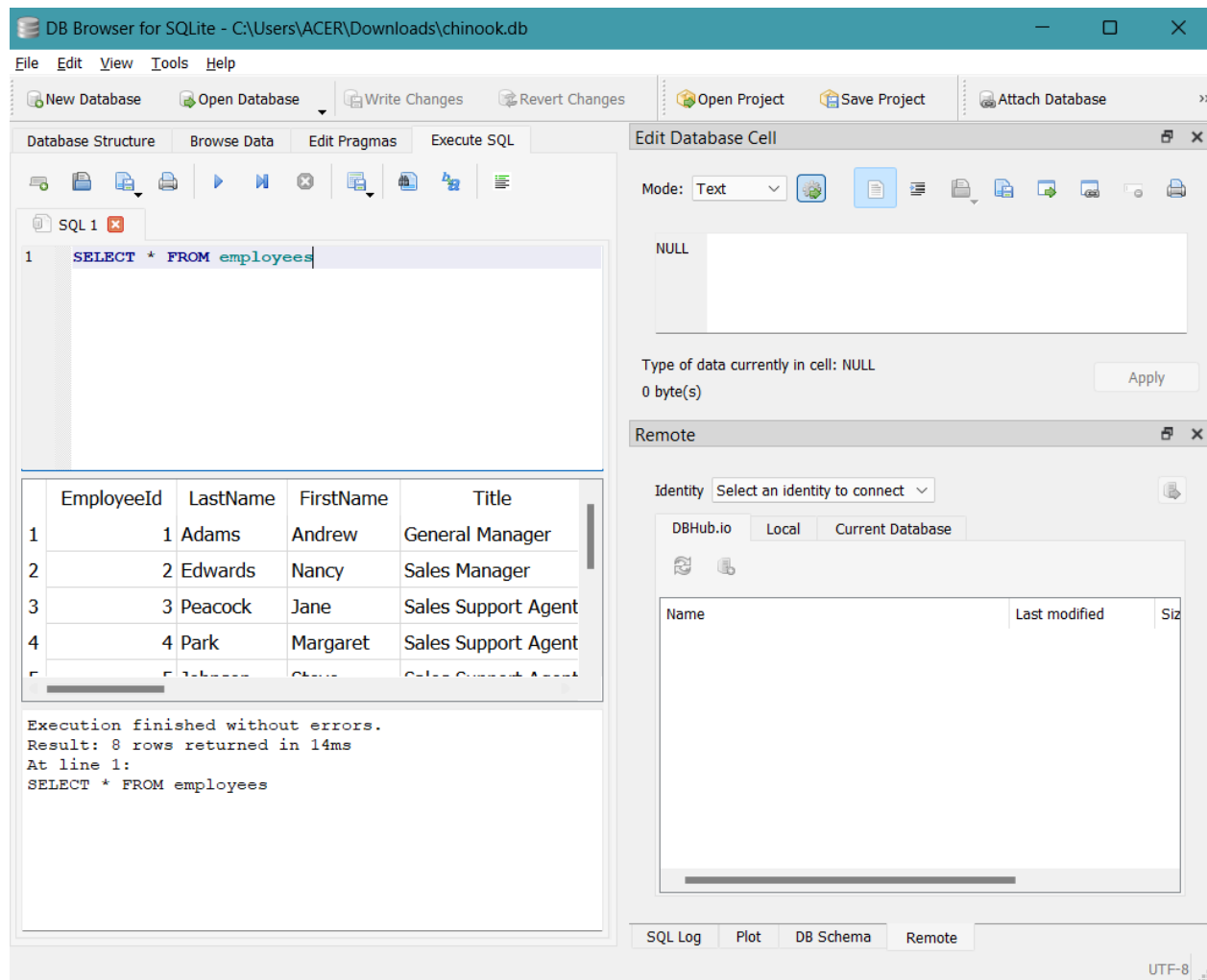


Figure 3: Using 'SELECT' Command to Open a Table in a Database

4. We did the same to the other database named books and executed SQL. Using the command 'SELECT * FROM book', we could access the table called "book".

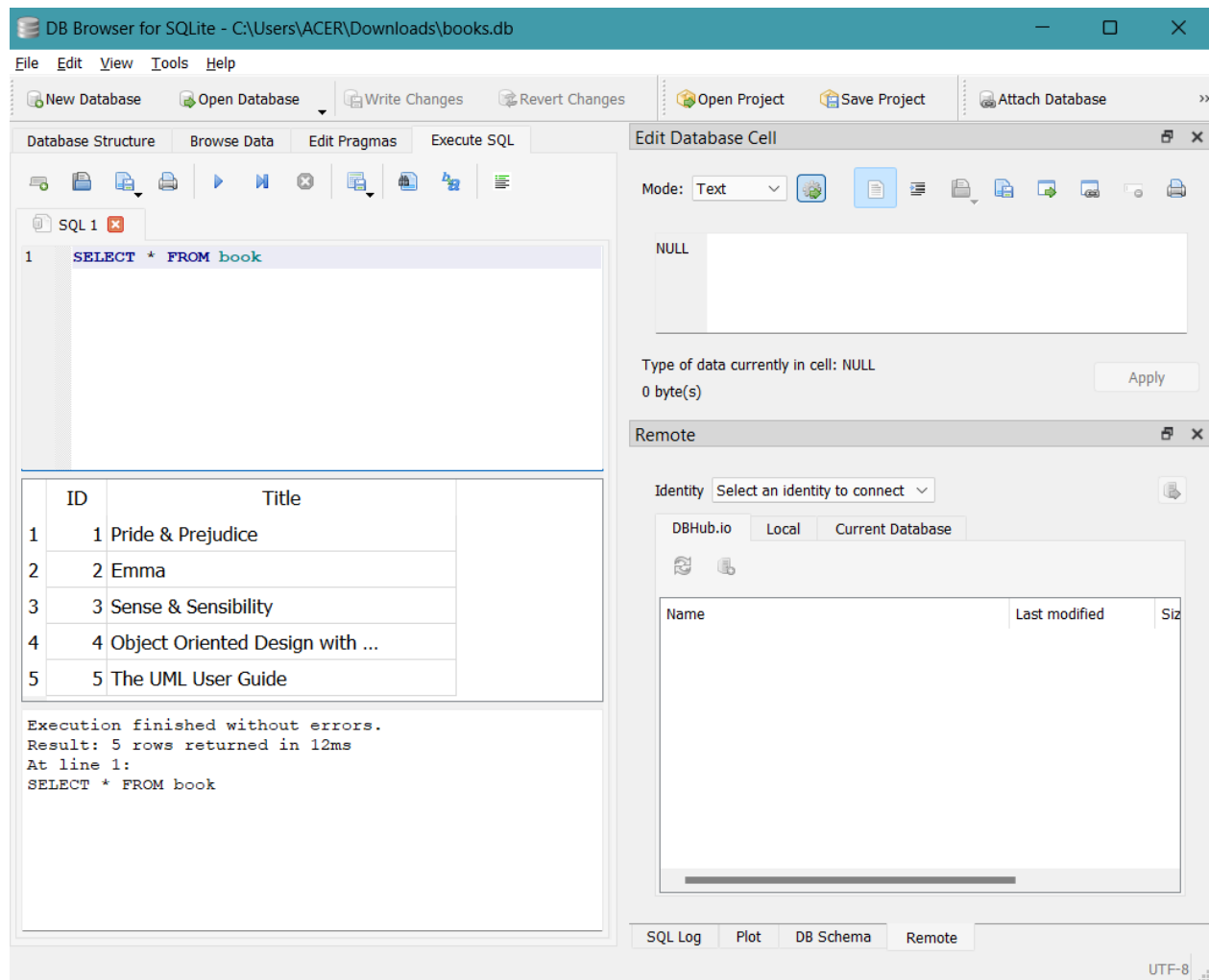


Figure 4: Opening Another Database and Accessing the Table Named 'Book'.

PostLab

Note: Leaders should assign the problems to members [Download SQL Scripts here >> SQL Scripts \(Colonial, etc.\)](#)

A. Machine Problems

1. Colonial Adventure Tours is considering offering outdoor adventure classes to prepare people to participate in hiking, biking, and paddling adventures. Only one class is taught on any given day. Participants can enroll in one or more classes. Classes are taught by the guides that Colonial Adventure employs. Participants do not know who the instructor for a particular class will be until the day of the class. Colonial Adventure Tours needs your help with the database design for this new venture. In each step, represent your answer using the shorthand representation and a diagram. Use crow's foot notation for the diagram. Follow the sample SQLite chinook database ERD (Download it from Blackboard Course Materials)

a) For each participant, list his or her number, last name, first name, address, city, state, postal code, telephone number, and date of birth.

b) For each adventure class, list the class number, class description, maximum number of people in the class, and class fee.

c) For each participant, list his or her number, last name, first name, and the class number, class description, and date of the class for each class in which the participant is enrolled.

d) For each class, list the class date, class number, and class description; and the number, last name, and first name of each participant in the class.

1. In Figure 5, we created our own database in the DB browser for SQLite with three tables: Class Participant, Class, and Participant.

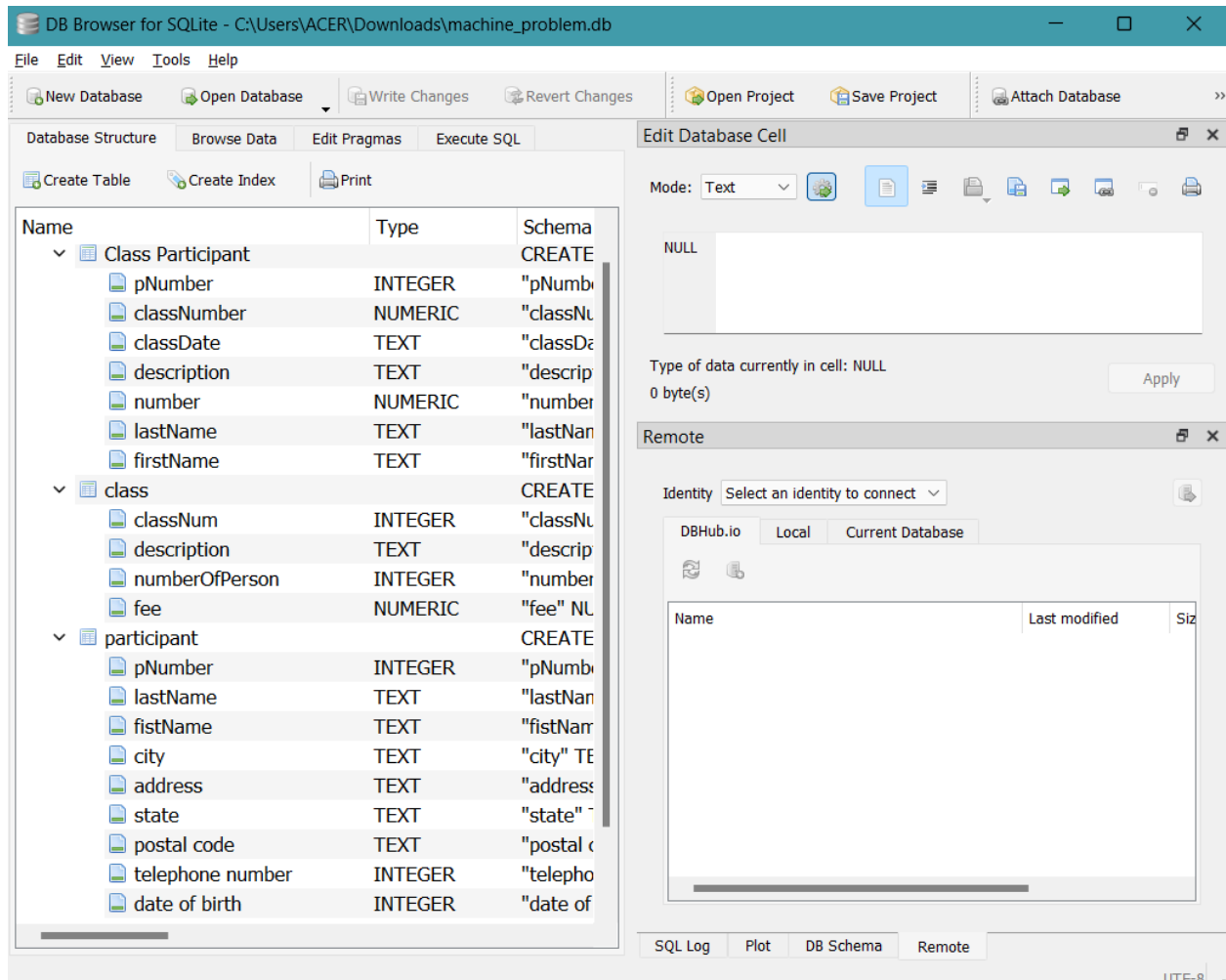


Figure 5: Creating our own Database.

- After creating a database that have tables named participant, class participant, and class we created a diagram to represent our tables. In figure 6, shows the relationship between tables in the database we created.

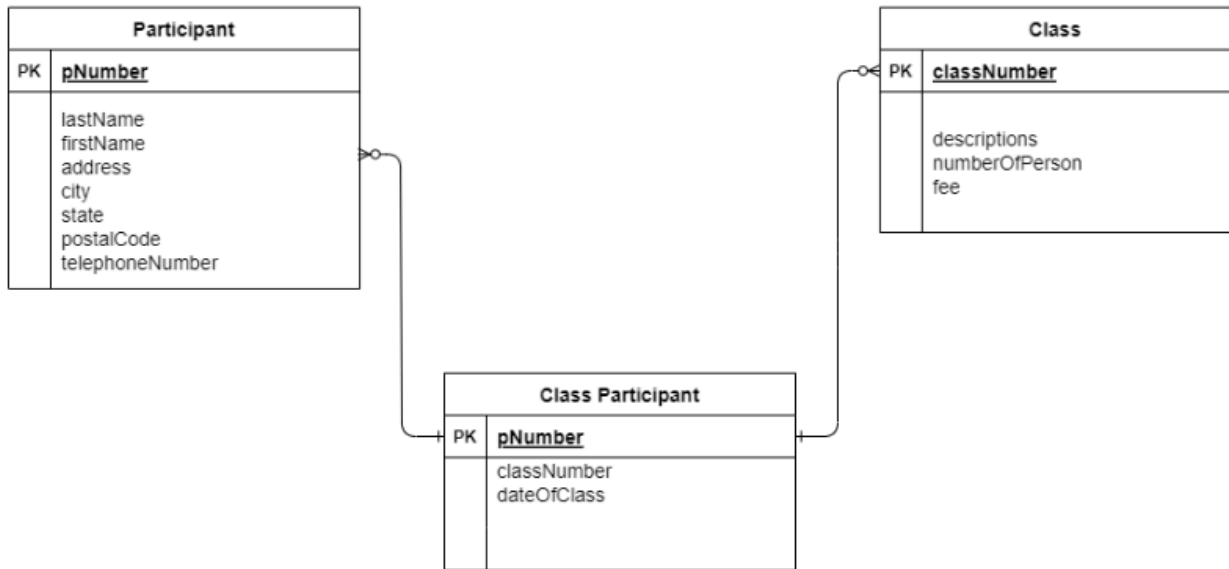


Figure 6: Relationship between Tables.

2. Solmaris Condominium Group has many condos that are available as weekly vacation rentals. Design

a database to meet the following requirements:

- For each renter, list his or her number, first name, middle initial, last name, address, city, state, postal code, telephone number, and email address.
- For each property, list the condo location number, condo location name, address, city, state, postal code, condo unit number, square footage, number of bedrooms, number of bathrooms, maximum number of persons that can sleep in the unit, and the base weekly rate.
- For each rental agreement, list the renter number, first name, middle initial, last name, address, city, state, postal code, telephone number, start date of the rental, end date of the rental, and the weekly rental amount. The rental period is one or more weeks.

3. Use SQLite commands to complete the following exercises.

a) Create a table named ADVENTURE_TRIP. The table has the same structure as the TRIP table shown in Figure 3-2 below except the TRIP_NAME column should use the VARCHAR data type and the DISTANCE and MAX_GRP_SIZE columns should use the NUMBER data type. Execute the command to describe the layout and characteristics of the ADVENTURE_TRIP table.

b) Add the following row to the ADVENTURE_TRIP table: trip ID: 45; trip name: Jay Peak; start location: Jay; state: VT; distance: 8; maximum group size: 8; type: Hiking and sea- son: Summer. Display the contents of the ADVENTURE_TRIP table.

c) Delete the ADVENTURE_TRIP table.

d) Open the script file (SQLServerColonial.sql) to create the six tables and add records to the tables. Revise the script file so that it can be run in the DB Browser.

e) Confirm that you have created the tables correctly by describing each table and comparing the results to the figures shown below. Confirm that you have added all data correctly by viewing the data in each table and comparing the results to Figures 1-4 through 1-8 shown below.

B. Debugging and Sample Run of Python program connection to your created SQLite database (with edited screengrabs and discussion)

IMPORTANT: Include figure numbers and labels. Edit your screengrabs