## Addendum to *Murach's Python Programming*

# DB Browser for SQLite

Remember that the only chapter in *Murach's Python Programming* that uses a SQLite database is chapter 17. So you don't need to install a development tool for working with SQLite databases if you aren't going to read that chapter or use the book programs, exercises, and solutions for that chapter.

If you are going to use a SQLite database, the bad news is that Firefox stopped supporting the SQLite Manager add-on that's described in the appendixes and chapter 17 of the book. Firefox did that in November of 2017 with release 57.

The good news is that *DB Browser for SQLite* is a standalone program that's easier to install and works better than SQLite Manager. It runs on Windows, Mac OS X, and Linux systems, and it is the program that we recommend for replacing SQLite Manager.

This addendum presents all the skills that you need for using DB Browser. Specifically, this addendum presents replacement pages for the pages in the appendixes and chapter 17 that are affected by this change. To that end, the figure numbers in this addendum correspond to the numbers of the figures in the book that they replace.

This addendum ends with a revised version of exercise 17-1. It has been modified so it uses DB Browser instead of SQLite Manager.

# How to install and use *DB Browser for SQLite* on a Windows system

The next two figures show how to install and use DB Browser on a Windows system. These are the replacement pages for appendix A.

## How to install DB Browser for SQLite

Figure A-3 shows how to install the software that you'll need on a Windows system. This is a typical installation procedure so it shouldn't present any problems.

### The download page for DB Browser for SQLite

`http://sqlitebrowser.org/`

### How to install DB Browser for SQLite

1. Find the download page for DB Browser for SQLite. The easiest way to do that is to search the Internet for "DB Browser for SQLite".
2. Follow the instructions on that web page to download the installer file.
3. Find the installer file on your system and run it.
4. Accept the default options.

### Description

- A *SQLite* database is used by the program in chapter 17.
- *DB Browser for SQLite* is the program that we recommend for viewing and editing a SQLite database as well as for running SQL statements against a SQLite database.
- If you aren't going to use the book applications, exercises, or solutions for chapter 17, you don't need to install DB Browser for SQLite.

Figure A-3 How to install *DB Browser for SQLite* on a Windows system

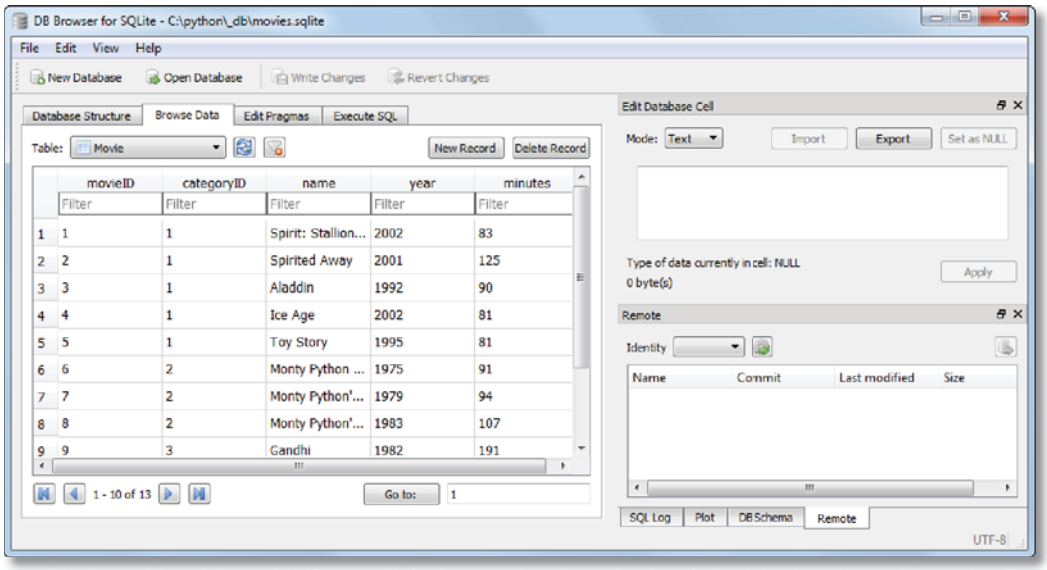
## How to use DB Browser to verify or restore a database

Figure A-4 shows how to verify that the database that's used by the program in chapter 17 of this book has been installed correctly. To do that, you use DB Browser to connect to the movies database and view the Movie table as shown in the first procedure in this figure.

The only problem you're likely to have is that the database isn't in the folder that's shown in this figure. If that's the case, you can either move the database into the correct folder, or use DB Browser to select it from the folder that it's in.

If you ever need to restore the database to its original state, the second procedure in this figure shows how to do that. To start, you use DB Browser to connect to the movies database. Then, you run the SQL script named create_movie_db.sql. Of course, another alternative is make a backup copy of the original database file before you start modifying the original.

## The Browse Data tab of DB Browser for SQLite




## How to verify that the database is installed correctly

1. Start DB Browser for SQLite.
2. Click the Open Database button. Then, use the resulting dialog box to select the SQLite database that's located here:
   **`\murach\python\_db\movies.sqlite`**
3. In the main panel, click the Browse Data tab.
4. Use the drop-down Table list at the top of the tab to select the Movie table. If DB Browser displays the data for the movies, the database was installed successfully.

## How to restore the database

1. Use DB Browser to open the movies database as described above.
2. Click the Execute SQL tab.
3. Click the Open SQL File button that's below the Execute SQL tab and use the resulting dialog box to select the SQL file that's located here:
   **`\murach\python\_db\create_movie_db.sql`**
4. Press F5 or click the Execute SQL button to execute the SQL statements and restore the database that's open.

Figure A-4 How to use DB Browser to verify or restore a database on a Windows system

# How to install and use *DB Browser for SQLite* on a Mac OS X system

The next two figures show how to install and use DB Browser on a Mac OS X system. These are the replacement figures for appendix B.

## How to install DB Browser for SQLite

Figure B-4 shows how to install the software that you'll need on a Mac OS X system. This is a typical installation procedure so it shouldn't present any problems.

### The download page for DB Browser for SQLite

**http://sqlitebrowser.org/**

### How to install DB Browser for SQLite

1. Find the download page for DB Browser for SQLite. The easiest way to do that is to search the Internet for "DB Browser for SQLite".
2. Follow the instructions on that web page to download the installer file.
3. Find the installer file on your system and run it.
4. Accept the default options.

### Description

- A *SQLite* database is used by the program in chapter 17.
- *DB Browser for SQLite* is the program that we recommend for viewing and editing a SQLite database as well as for running SQL statements against a SQLite database.
- If you aren't going to use the book applications, exercises, or solutions for chapter 17, you don't need to install DB Browser for SQLite.

Figure B-4 How to install *DB Browser for SQLite* on a Mac OS X system

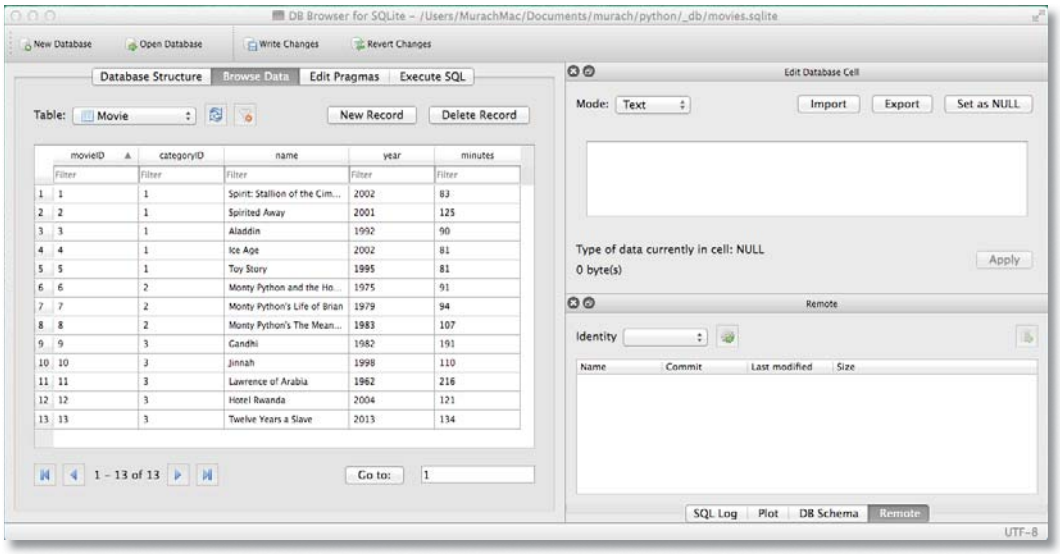
## How to use DB Browser to verify or restore a database

Figure B-5 shows how to verify that the database that's used by the program in chapter 17 of this book has been installed correctly. To do that, you use DB Browser to connect to the movies database and view the Movie table as shown in the first procedure in this figure.

The only problem you're likely to have is that the database isn't in the folder that's shown in this figure. If that's the case, you can either move the database into the correct folder, or use DB Browser to select it from the folder that it's in.

If you ever need to restore the database to its original state, the second procedure in this figure shows how to do that. To start, you use DB Browser to connect to the movies database. Then, you run the SQL script named create_movie_db.sql. Of course, another alternative is make a backup copy of the original database file before you start modifying the original.

## The Browse Data tab of DB Browser for SQLite




## How to verify that the database is installed correctly

1. Start DB Browser for SQLite.
2. Click the Open Database button. Then, use the resulting dialog box to select the SQLite database that's located here:
   **`\murach\python\_db\movies.sqlite`**
3. In the main panel, click the Browse Data tab.
4. Use the drop-down Table list at the top of the tab to select the Movie table. If DB Browser displays the data for the movies, the database was installed successfully.

## How to restore the database

1. Use DB Browser to open the movies database as described above.
2. Click the Execute SQL tab.
3. Click the Open SQL File button that's below the Execute SQL tab and use the resulting dialog box to select the SQL file that's located here:
   **`\murach\python\_db\create_movie_db.sql`**
4. Press F5 or click the Execute SQL button to execute the SQL statements and restore the database that's open.

Figure B-5 How to use DB Browser to verify or restore a database on a Mac OS X system

# How to use *DB Browser for SQLite* to work with a database

*The next two figures show how to use DB Browser. These are the replacement figures for chapter 17.*

*SQLite* is a popular open-source relational database that can be embedded into programs. This chapter shows how to use SQLite as your database because it's easy to set up and because Python includes built-in support for working with SQLite.

To work with a SQLite database, we recommend that you install and use *DB Browser for SQLite*. If you haven't already installed DB Browser, the appendix for your operating system will show you how.

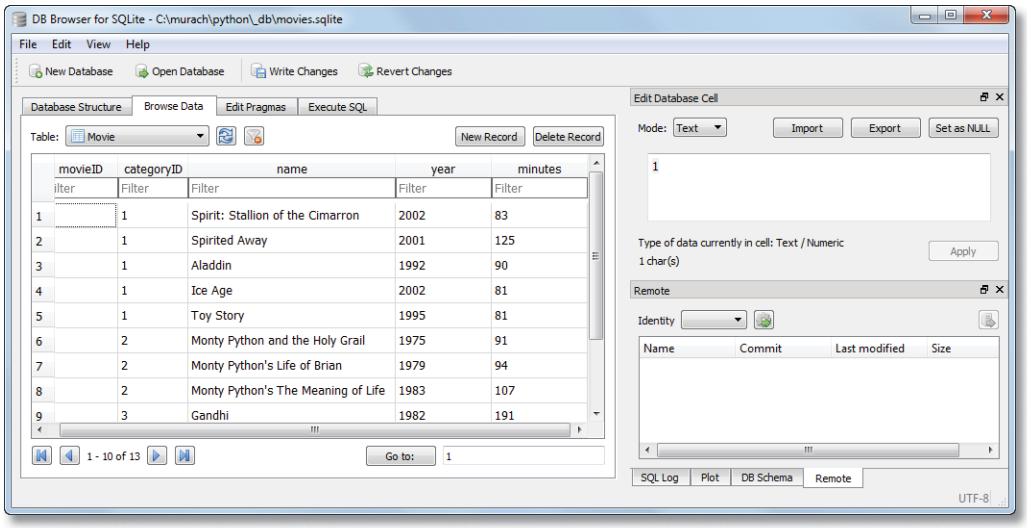
## How to use DB Browser to view and edit a table in a SQLite database

Figure 17-7 begins by showing how open the file for the database. After the file is opened, the tree for the tables in the database is displayed in the Database Structure tab. If you expand the tables in this tree, you can see how the columns in the tables are defined.

To view the data in one of the tables, you can click on the Browse Data tab and select the table you want to view from the drop-down Table list. This displays the data in all the rows and columns of the table. In this figure, the data in the Movie table is displayed. As you view a table, you can sort it by the data in any of the columns, just by clicking on the column name.

To edit the data in the rows and columns, you can just change the data in the cells. To add or delete rows, you can click on the New Record or Delete Record button. Then, to save any changes to the table, you can click the Write Changes button. Or, to cancel the changes, you can click on the Revert Changes button.

## DB Browser for SQLite while using the Browse Data tab to view a table




### How to open a database

1. Start DB Browser for SQLite.
2. Click the Open Database button or choose the File→Open Database command. Then, use the dialog box to select the SQLite database you want to open. The database for this chapter is located here:
   **`\murach\python\_db\movies.sqlite`**
3. This displays the tree structure of the database in the Database Structure tab.

### How to view a table

1. Click the Browse Data tab.
2. Use the drop-down Tables list to select the table that you want to view.
3. To sort the table by the values in a column, click on the column name.

### How to edit a table

- To edit the data in the rows, change the data in the table.
- To add or delete rows, use the New Record or Delete Record button.
- To save the changes, click the Write Changes button.
- To cancel the changes, click the Revert Changes button.

### Warning

- There may be a bug in the way the New Record button works. For instance, it works with the Category table but reports an error with the Movie table. So remember that you can also add records by using SQL INSERT statements, as in the next figure.

Figure 17-7 How to use DB Browser for SQLite to view and edit a database table

## How to use DB Browser to run SQL statements

After you use DB Browser to open a database, you can use it to execute SQL statements against that database. This can help you test your SQL statements before you use them in your Python code, and it can help you debug SQL statements that aren't working correctly.

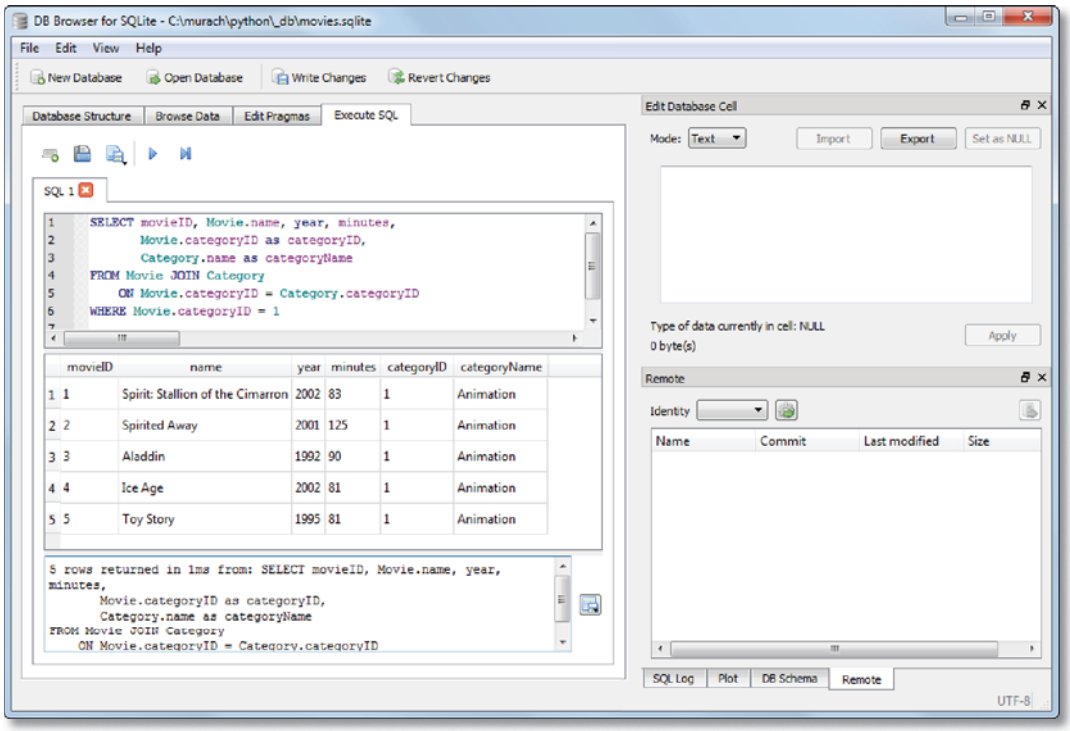
Figure 17-8 shows how to use DB Browser to execute a SQL statement. To start, you click on the Execute SQL tab, enter a SQL statement, and click the Execute SQL button. For a SELECT statement, DB Browser then displays the result set in a table below the SQL statement and a completion message below the result set, as shown in this figure.

Of course, INSERT, UPDATE, and DELETE statements don't return a result set. So, for those statements, DB Browser doesn't display a result set. However, it still executes the statement, which modifies the data in the database, and it still displays a completion message. Then, you can use the Browse Data tab to make sure that the insertions, updates, and deletions were done correctly.

This assumes that the SQL statements don't contain errors. But if they do, DB Browser displays error messages instead of completion messages. These messages will often help you find and fix the errors.

To make it easy to identify the keywords in a SQL statement, the examples in this book capitalize the keywords. You should realize, however, that this capitalization is optional. So, if you want to use lowercase letters in the keywords when you type them into DB Browser, you can do that.

## The Execute SQL tab after a SQL statement has been executed




## How to execute a SQL statement

- Click the Execute SQL tab.
- Enter the SQL statement.
- Click the Execute SQL button.

## Description

- When a SELECT statement is run, the result set is displayed in a table below the SQL statement, and a completion message is displayed below the result set.
- When an INSERT, UPDATE, or DELETE statement is run, a result set isn't returned, but a completion message is displayed. Then, you can use the Browse Data tab to see whether the right rows have been inserted, updated, or deleted.
- If the SQL statement contains errors when it is run, an error message is displayed that can help you find the cause of the error.

Figure 17-8 How to use DB Browser for SQLite to run a SQL statement

## Exercise 17-1 Review a SQLite database and test some SQL statements

This exercise gives you a chance to use *DB Browser for SQLite* to review the SQLite database that's used by the Movie List program that's presented in this chapter. You will also use DB Browser it to test some SQL statements against this database.

### Use DB Browser for SQLite to connect to the movies database

1. If you haven't already installed DB Browser for SQLite, do that now. For instructions, please see the appendix for your operating system.
2. Start DB Browser for SQLite. Then, use DB Browser to open the database named movies.sqlite that's in this directory:
   **`murach/python/_db`**

### Review the tables in the movies database

3. Use the Browse Data tab to review the data in the Movie table.
4. Use the Browse Data tab to review the data in the Category table.

### Run SQL statements against the movies database

5. Use the Execute SQL tab to enter a query that selects all columns from the Movie table where the category ID is 2, and click the Run SQL button to execute this statement. This should display a result set.
6. Modify the value for the category ID in the query so it only selects movies that have a category ID of 3. Then, run this query and view the result set.
7. Modify the query so it only returns the name and year columns. Then, run this query and view the result set.
8. Modify the query so it sorts the result set by year in descending order.
9. Enter an INSERT statement that inserts a new row into the Movie table. Then, run this SQL statement. This shouldn't display a result set, but it should add a new row to the Movie table.
10. Use the Browse Data tab to browse the Movie table and view the new row.
11. Use the Execute SQL tab to run a DELETE statement that deletes the new row.
12. Use the Browse Data tab to make sure the row was deleted.
13. Continue to experiment until you're sure that you understand the SQL statements that are used by the Movie List program in this chapter.