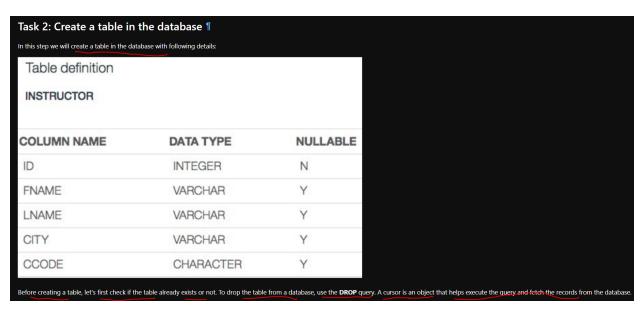
## Hands-on Lab: Creating tables, inserting and querying Data

# Create & Access SQLite database using Python Estimated time needed: 15 minutes Objectives After completing this lab you will be able to: Create a database Create a database Create a table Insert data into the table Query data from the table Query data from the table Retrieve the result set into a pandas dataframe Close the database connection SQLite is a software library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. SQLite is the most widely deployed SQL database engine in the world.





```
## Drop, the table if already exists.

cursor_obj_execute("OROP TABLE IF EXISTS INSTRUCTOR")

csqlite3.Cursor at 0x79253630140>

Dont worry if you get this error:

If you see an exception/error similar to the following, indicating that INSTRUCTOR is an undefined name, that's okay, It just implies that the INSTRUCTOR table does not exist in the table - which would be the case if you had not created it previously.

Exception: [IBM][CLI Driver][DB2/LINUXX8664] SQL0204N "ABC12345.INSTRUCTOR" is an undefined name. SQLSTATE=42704 SQLCODE=-204

### Creation table

table = "" create table IF NOT EXISTS INSTRUCTOR(ID INTEGER PRIMARY KEY NOT NULL, Flawe VARGHAR(20), LHAME VARGHAR(20), CCCODE CHAR(2)); """

cursor_obj_execute(table)

print("Table is Ready")

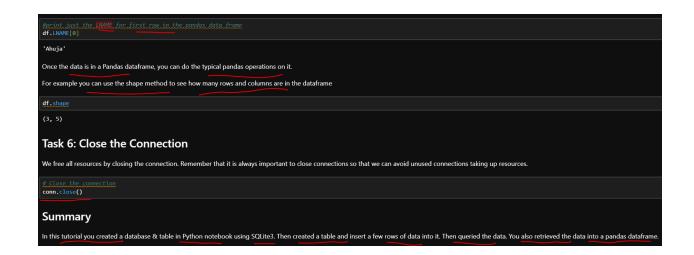
Table is Ready")
```

#### Task 3: Insert data into the table In this step we will insert some rows of data into the table. The INSTRUCTOR table we created in the previous step contains 3 rows of data: **INSTRUCTOR** ID **FNAME** LNAME CITY CCODE VARCHAR(20) CHARACTER(2) **INTEGER** VARCHAR(20) VARCHAR(20) Rav Ahuja **TORONTO** CA 2 Raul Chong Markham CA US 3 Hima Vasudevan Chicago We will start by inserting just the first row of data, i.e. for instructor Rav Ahuja cursor\_obj.execute('''insert into INSTRUCTOR values (1, 'Rav', 'Abuja', 'TORONTO', 'CA')''') <sqlite3.Cursor at 0x7f9253630140> The output you will get something as: sqlite3.Cursor at 0x27a1a491260 which means mySql database has sqlite3.Cursor object at 0x27a1a49126 as output in table. But you may get the different number. Now use a single query to insert the remaining two rows of data cursor\_obj\_execute('''insert into INSTRUCTOR values (2, 'Raul', 'Chong', 'Markham', 'CA'), (3, 'Hima', 'Vasudevan', 'Chicago', 'US')''') csqlite3.Cursor at 0x7f9253630140>

### Task 4: Query data in the table In this step we will retrieve data we inserted into the INSTRUCTOR table. statement = '''SELECT \* FROM INSTRUCTOR''' cursor\_obj.execute(statement) print("All the data") output\_all = cursor\_obj.fetchall() for row\_all in output\_all: print(row all) (1, 'Rav', 'Ahuja', 'TORONTO', 'CA') (2, 'Raul', 'Chong', 'Markham', 'CA') (3, 'Hima', 'Vasudevan', 'Chicago', 'US') ## Fetch few rows from the table statement = '''SELECT \* FROM INSTRUCTOR''' cursor\_obj.execute(statement) output\_many = cursor\_obj.fetchmany(2)\_ for row\_many in output\_many: print(row many) All the data (1, 'Rav', 'Ahuja', 'TORONTO', 'CA') (2, 'Raul', 'Chong', 'Markham', 'CA')

```
# Fetch only FNAME from the table
statement = '''SELECT FNAME FROM INSTRUCTOR'''
cursor_obj.execute(statement)
print("All the data")
output_column = cursor_obj.fetchall()
for fetch in output_column:
 print(fetch)
All the data
('Rav',)
('Raul',)
('Hima',)
Bonus: now write and execute an update statement that changes the Rav's CITY to MOOSETOWN
query_update='''update INSTRUCTOR set CITY='MOOSETOWN' where FNAME="Rav"'''
cursor_obj.execute(query_update)
<sqlite3.Cursor at 0x7f9253630140>
statement = '''SELECT * FROM INSTRUCTOR'''
cursor_obj.execute(statement)
print("All the data")
output1 = cursor_obj.fetchmany(2)
for row in output1:
  print(row)
All the data (1, 'Rav', 'Ahuja', 'MOOSETOWN', 'CA') (2, 'Raul', 'Chong', 'Markham', 'CA')
```

#### Task 5: Retrieve data into Pandas In this step we will retrieve the contents of the INSTRUCTOR table into a Pandas dataframe !pip install pandas import pandas as pd #retrieve the query results into a pandas dataframe df = pd.read\_sql\_query("select \* from instructor;", conn) #print the dataframe df Collecting pandas $Downloading\ pandas-2.3.0-cp312-cp312-manylinux\_2\_17\_x86\_64.manylinux2014\_x86\_64.whl.metadata\ (91\ kB)$ Collecting numpy>=1.26.0 (from pandas) Downloading numpy-2.3.1-cp312-cp312-manylinux\_2\_28\_x86\_64.whl.metadata (62 kB) Requirement already satisfied: python-dateutil>=2.8.2 in /opt/conda/lib/python3.12/site-packages (from pandas) (2.9.0.post0) Requirement already satisfied: pytz>=2020.1 in /opt/conda/lib/python3.12/site-packages (from pandas) (2024.2) Collecting tzdata>=2022.7 (from pandas) Downloading tzdata-2025.2-py2.py3-none-any.whl.metadata (1.4 kB) Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.12/site-packages (from python-dateutil>=2.8.2->pandas) (1.17.0) Downloading pandas-2.3.0-cp312-cp312-manylinux\_2\_17\_x86\_64.manylinux2014\_x86\_64.whl (12.0 MB) s eta 0:00:00 Downloading numpy-2.3.1-cp312-cp312-manylinux\_2\_28\_x86\_64.whl (16.6 MB) Downloading tzdata-2025.2-py2.py3-none-any.whl (347 kB) Installing collected packages: tzdata, numpy, pandas Successfully installed numpy-2.3.1 pandas-2.3.0 tzdata-2025.2 ID FNAME LNAME CITY CCODE 0 1 Rav Ahuja MOOSETOWN CA Raul Chong Markham



2 3

Hima Vasudevan

Chicago

US