

Certura Internship Program (Database Handling)

Task No: 03

Submitted by:

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Submitted to:

Certura.

✓ TOOLS USED

1. **Python**
 - Programming language for scripting the backup.
 2. **SQLite**
 - Lightweight database for easy handling.
 3. **SQLite3 Library (Python)**
 - Python built-in library to connect to SQLite databases.
-

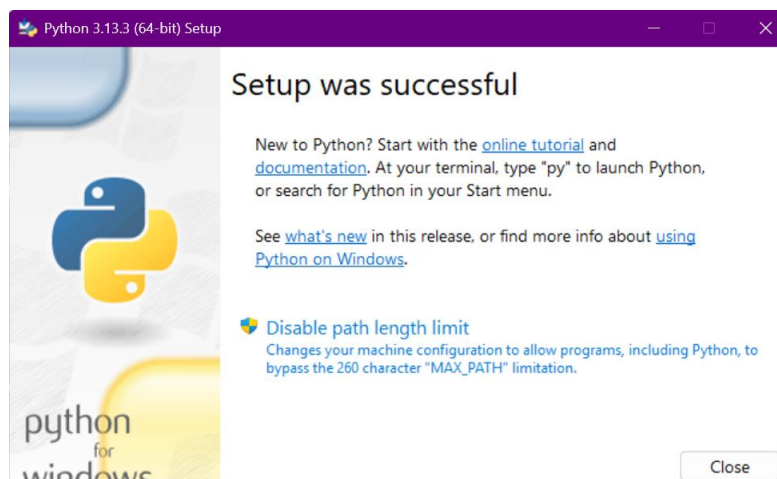
□ TASK: 3

Goal: Write a script to **back up** and **restore** a database.
We'll solve it practically in easy-to-follow steps.

🔧 How to Solve the Task (Detailed Steps)

Step 1: Setup Environment

- Install Python (if not already installed).
- SQLite comes built-in with Python, so no extra installation needed.
- Use any simple code editor (VS Code, PyCharm, or even Notepad++).



```
Command Prompt
2.6.0

C:\Users\huzai>pip install mysql-connector
Collecting mysql-connector
  Downloading mysql-connector-2.2.9.tar.gz (11.9 MB)
    Installing build dependencies ... done
    Getting requirements to build wheel ... done
    Preparing metadata (pyproject.toml) ... done
Building wheels for collected packages: mysql-connector
  Building wheel for mysql-connector (pyproject.toml) ... done
    Created wheel for mysql-connector: filename=mysql_connector-2.2.9-cp313-cp313-win_amd64.whl size=248050 sha256=b3f38235b04a8491fafc
e34912b5133dc4f0ad261cc9cbb18353e0a500720e66
    Stored in directory: c:\users\huzai\appdata\local\pip\cache\wheels\4e\c1\23\9423c444a75266a05275c80ebf5c6efe2368388e976b690a0f
Successfully built mysql-connector
Installing collected packages: mysql-connector
Successfully installed mysql-connector-2.2.9

[notice] A new release of pip is available: 25.0.1 -> 25.1
[notice] To update, run: python.exe -m pip install --upgrade pip

C:\Users\huzai>python.exe -m pip install --upgrade pip
Requirement already satisfied: pip in c:\users\huzai\appdata\local\programs\python\python313\lib\site-packages (25.0.1)
Collecting pip
  Downloading pip-25.1-py3-none-any.whl.metadata (3.6 kB)
  Downloading pip-25.1-py3-none-any.whl (1.8 MB)
    Installing collected packages: pip
    Attempting uninstall: pip
      Found existing installation: pip 25.0.1
      Uninstalling pip-25.0.1:
        Successfully uninstalled pip-25.0.1
    Successfully installed pip-25.1

C:\Users\huzai>
```

Step 2: Create a Sample Database

First, we'll create a simple database manually to back up later.

```
import sqlite3

# Connect to (or create) a database
conn = sqlite3.connect('sample_db.db')
cursor = conn.cursor()

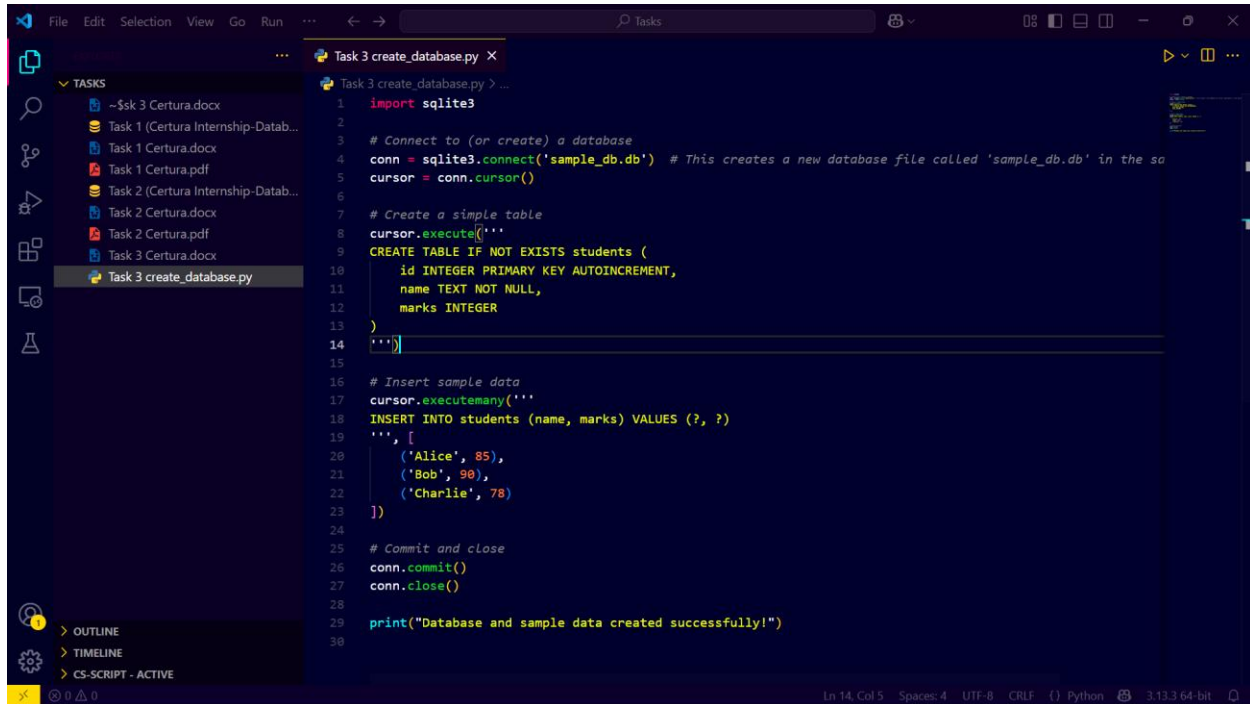
# Create a simple table
cursor.execute('''
CREATE TABLE IF NOT EXISTS students (
    id INTEGER PRIMARY KEY AUTOINCREMENT,
    name TEXT NOT NULL,
    marks INTEGER
)
''')

# Insert sample data
cursor.executemany('''
INSERT INTO students (name, marks) VALUES (?, ?)
''', [
    ('Alice', 85),
    ('Bob', 90),
    ('Charlie', 78)
])

# Commit and close
```

```
conn.commit()
conn.close()
```

✓ Running this will create a **sample_db.db** database with a **students** table.



The screenshot shows a code editor with a file explorer on the left and a code editor on the right. The file explorer shows a project structure with files like 'Task 1 Certura.docx', 'Task 1 Certura.pdf', 'Task 2 Certura.docx', 'Task 2 Certura.pdf', 'Task 3 Certura.docx', and 'Task 3 create_database.py'. The code editor shows the following Python code:

```
1 import sqlite3
2
3 # Connect to (or create) a database
4 conn = sqlite3.connect('sample_db.db') # This creates a new database file called 'sample_db.db' in the sa
5 cursor = conn.cursor()
6
7 # Create a simple table
8 cursor.execute('''
9 CREATE TABLE IF NOT EXISTS students (
10     id INTEGER PRIMARY KEY AUTOINCREMENT,
11     name TEXT NOT NULL,
12     marks INTEGER
13 )
14 ''')
15
16 # Insert sample data
17 cursor.executemany('''
18 INSERT INTO students (name, marks) VALUES (?, ?)
19 ''', [
20     ('Alice', 85),
21     ('Bob', 90),
22     ('Charlie', 78)
23 ])
24
25 # Commit and close
26 conn.commit()
27 conn.close()
28
29 print("Database and sample data created successfully!")
30
```

```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\huzai> cd "D:\My Internships\Certura\Tasks"
PS D:\My Internships\Certura\Tasks> python create_database.py
Database and sample data created successfully!
PS D:\My Internships\Certura\Tasks>
```

Step 3: Write a Backup Script

Now, we will export (backup) the database content to a `.sql` file.

```
import sqlite3

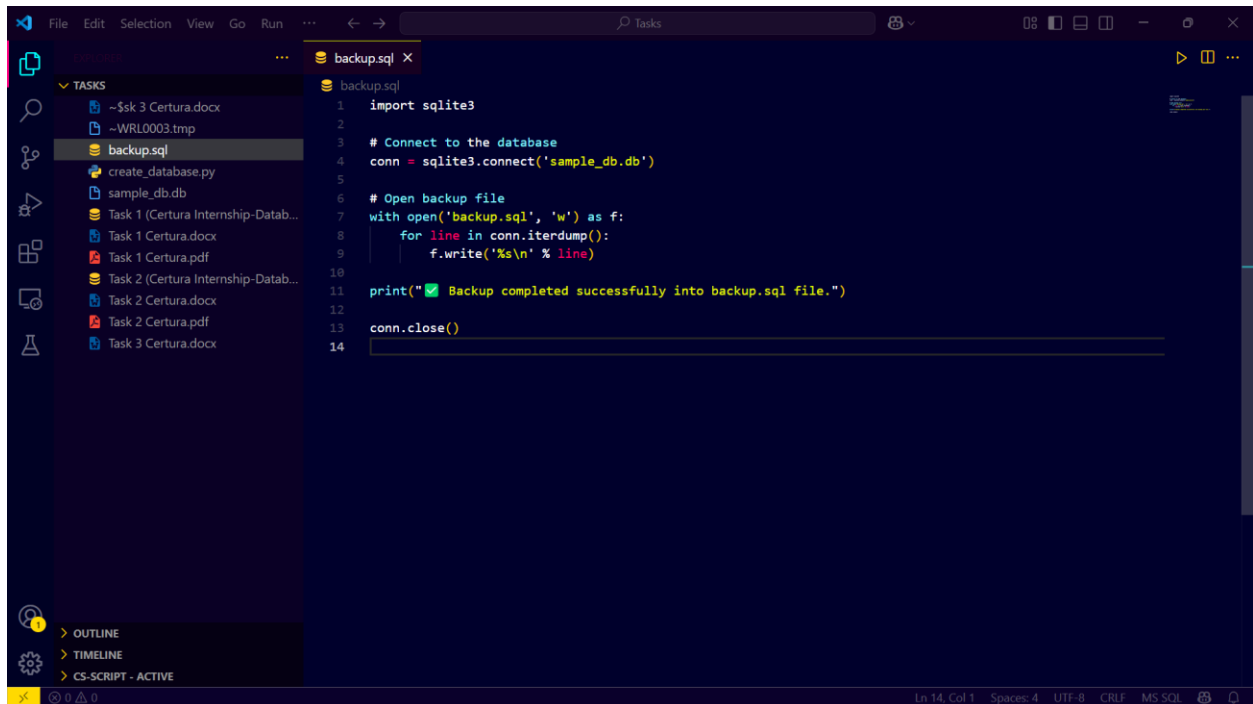
# Connect to the database
conn = sqlite3.connect('sample_db.db')
```

```
# Open backup file
with open('backup.sql', 'w') as f:
    for line in conn.iterdump():
        f.write('%s\n' % line)

print("✔ Backup completed successfully into backup.sql file.")

conn.close()
```

✔ This creates a file **backup.sql** containing the entire database structure and data.



```
PS D:\My Internships\Certura\Tasks> python backup.py
✔ Backup completed successfully into backup.sql file.
PS D:\My Internships\Certura\Tasks>
```

Step 4: Write a Restore Script

Now, let's write a script to restore from the backup file.

```
import sqlite3

# Connect to a new database (for restore)
conn = sqlite3.connect('restored_db.db')
cursor = conn.cursor()
```

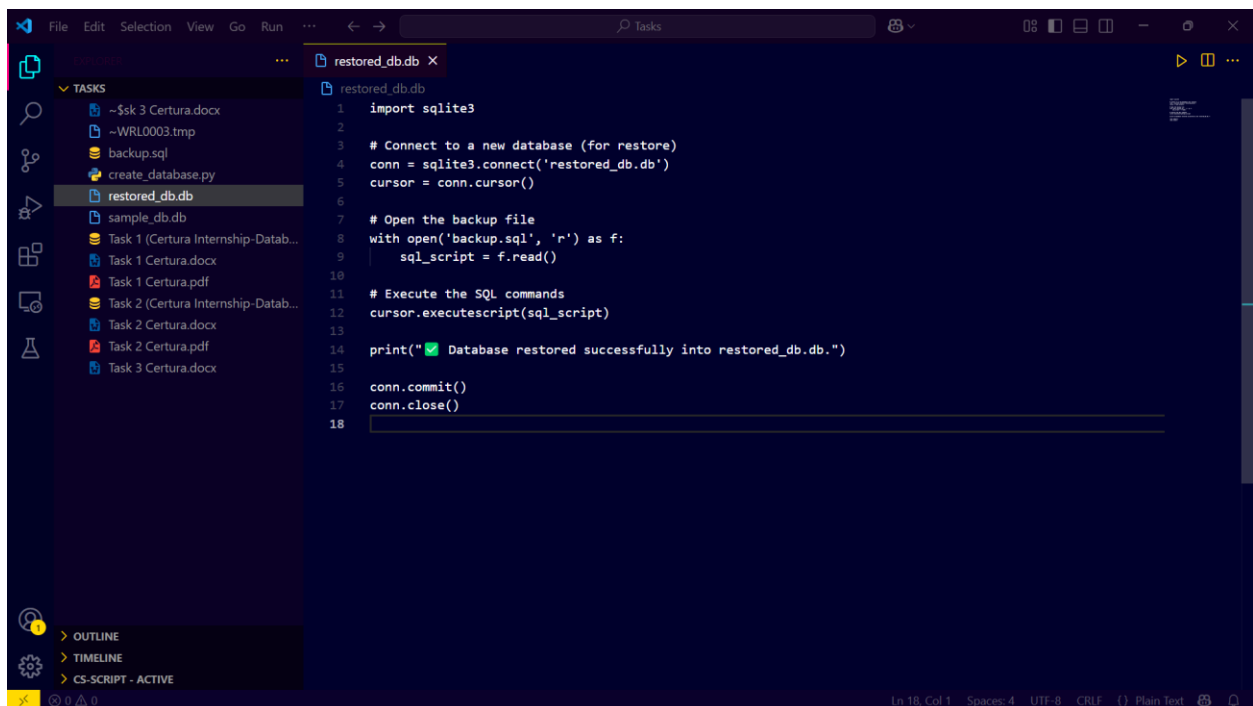
```
# Open the backup file
with open('backup.sql', 'r') as f:
    sql_script = f.read()

# Execute the SQL commands
cursor.executescript(sql_script)

print("✔ Database restored successfully into restored_db.db.")

conn.commit()
conn.close()
```

✔ Running this will create a **restored_db.db** which is a copy of the original database.



```
PS D:\My Internships\Certura\Tasks> python restore.py
✔ Database restored successfully into restored_db.db.
PS D:\My Internships\Certura\Tasks>
```

Step 5: Test Backup and Restore

- Check if **restored_db.db** has the `students` table and data.
- You can query it using another small Python snippet:

```
import sqlite3

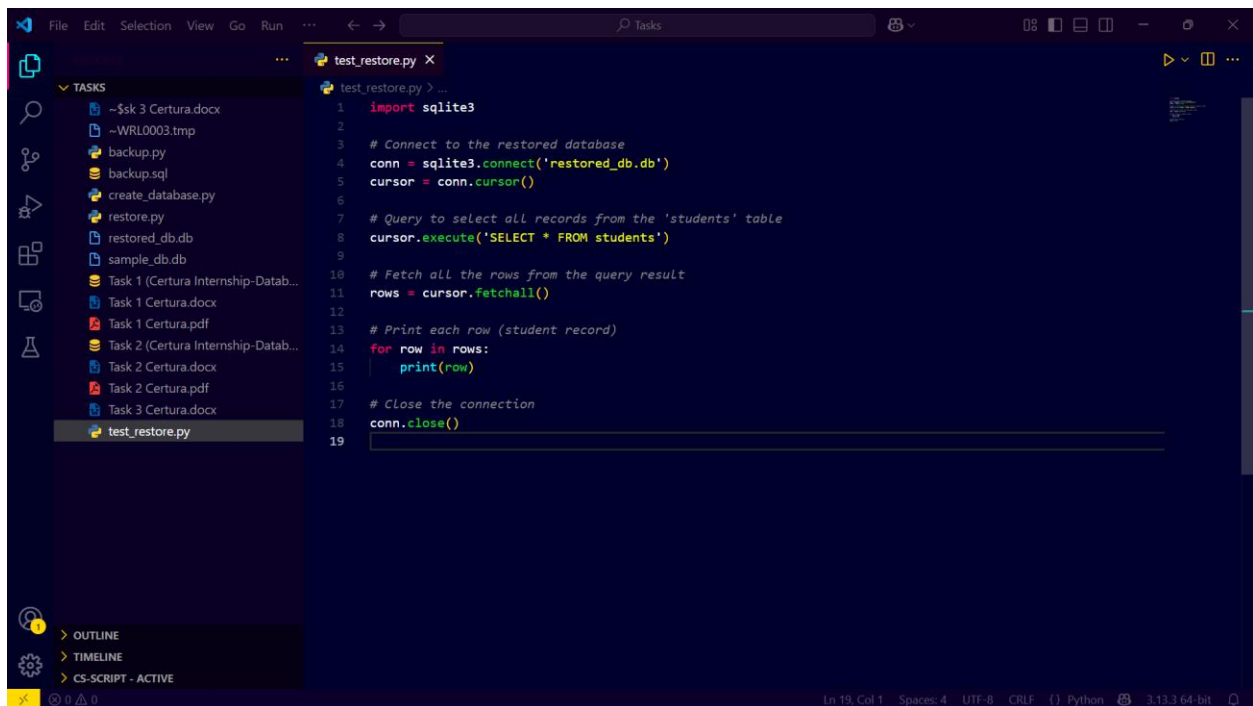
conn = sqlite3.connect('restored_db.db')
cursor = conn.cursor()

cursor.execute('SELECT * FROM students')
rows = cursor.fetchall()

for row in rows:
    print(row)

conn.close()
```

✓ It should display the same student records.



```
PS D:\My Internships\Certura\Tasks> python test_restore.py
(1, 'Alice', 85)
(2, 'Bob', 90)
(3, 'Charlie', 78)
PS D:\My Internships\Certura\Tasks>
```

📁 Final Summary (In Short)

Step	Task
1	Setup Python and SQLite
2	Create sample database
3	Write backup script (to backup.sql)
4	Write restore script (to restored_db.db)
5	Test backup and restore
