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.

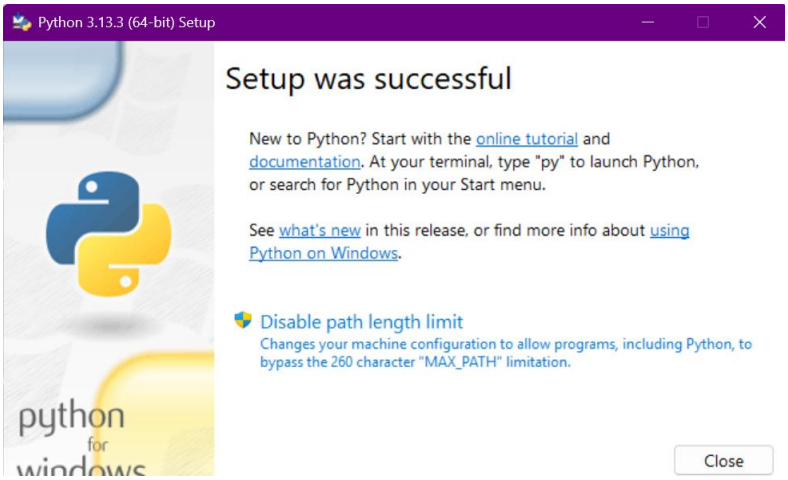
□ TASK: 3

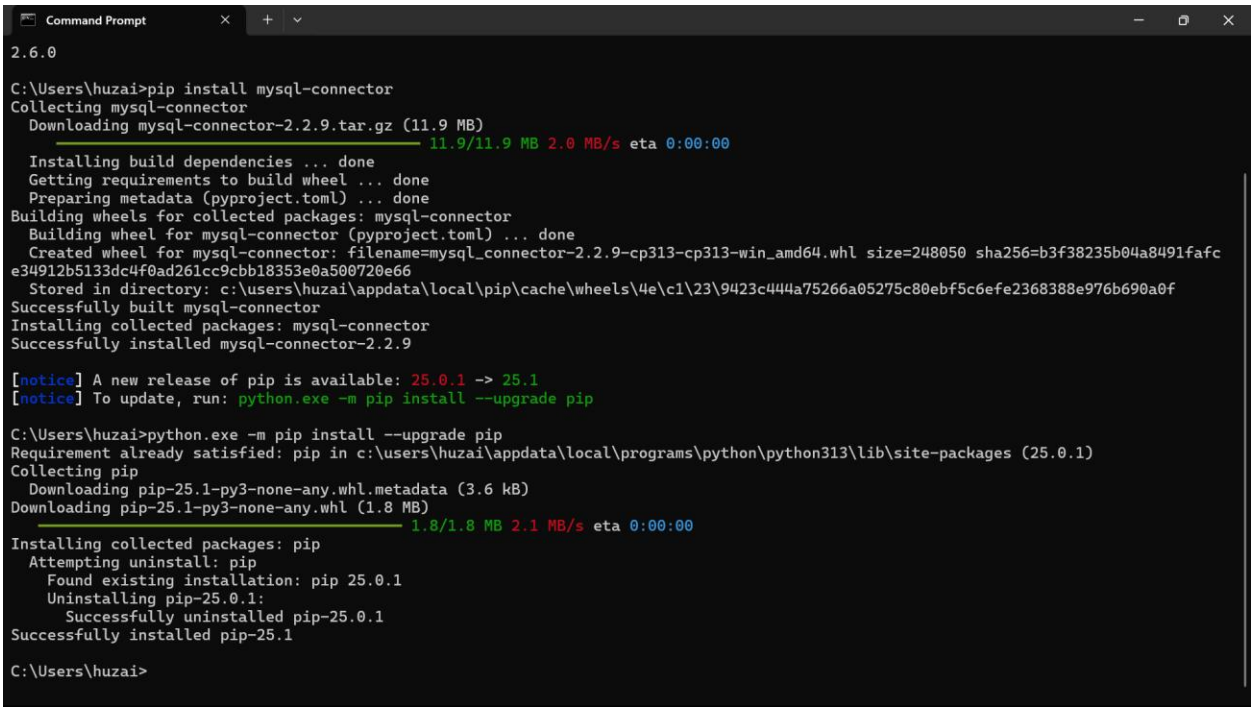
Goal: Write a script to **back up** and **restore** a database.
We'll solve it practically in easy-to-follow steps.

🔑 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++).





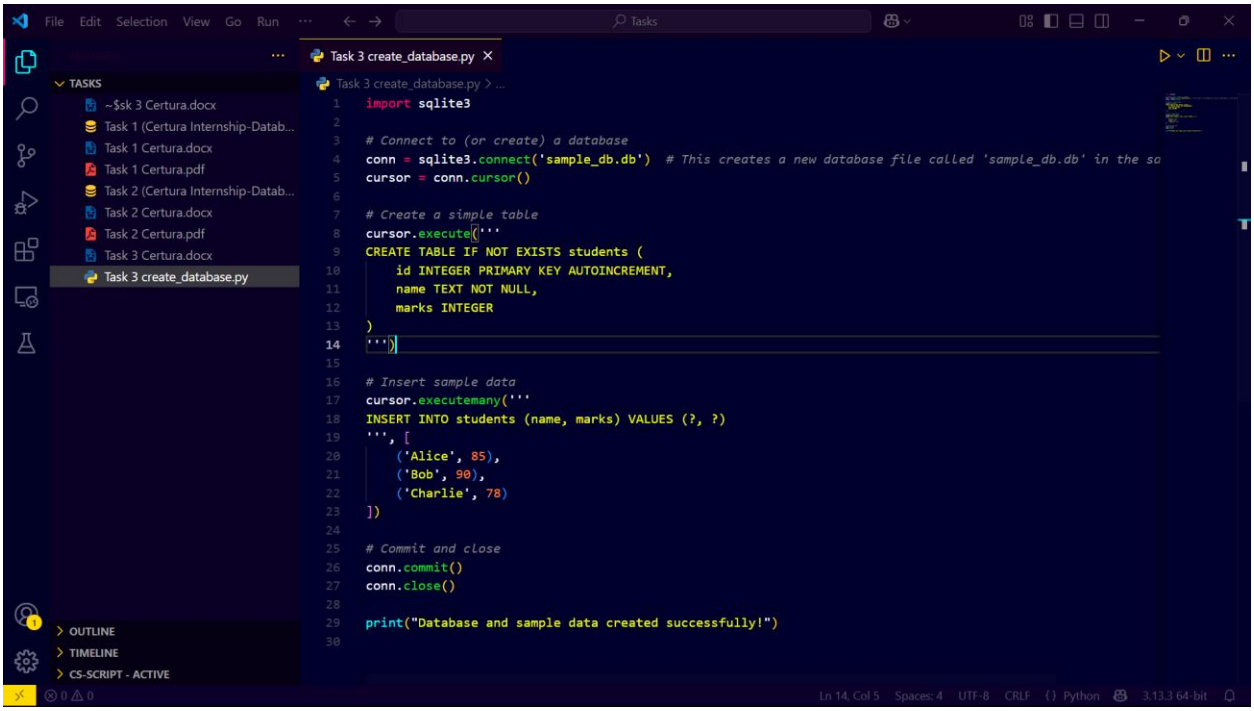
Step 2: Create a Sample Database

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.




```
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>
```
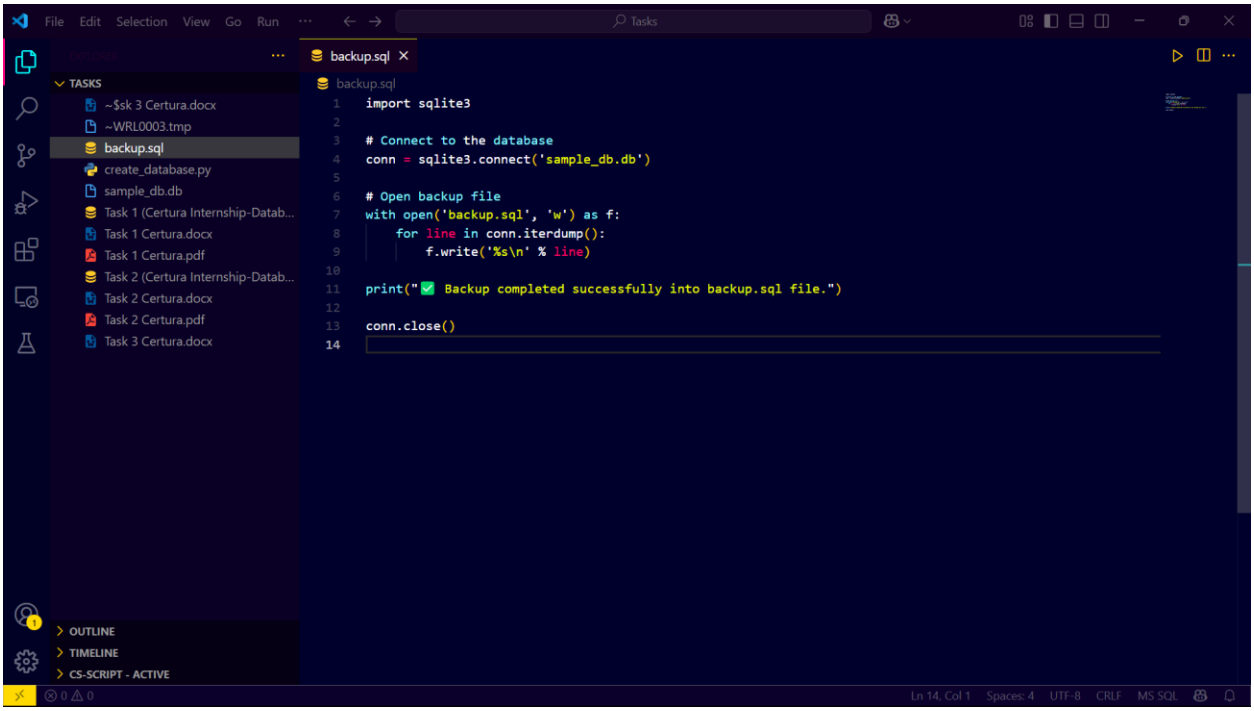

Step 3: Write a Backup Script

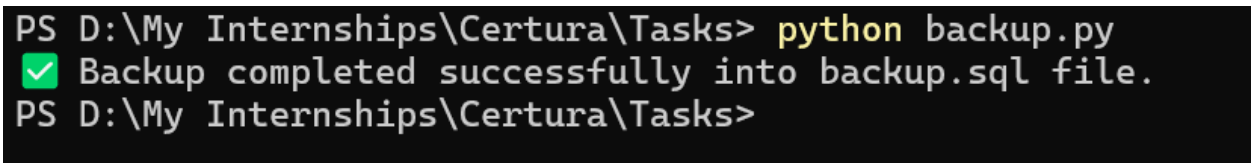
Now, we will export (backup) the database content to a `.sql` file.

```
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.





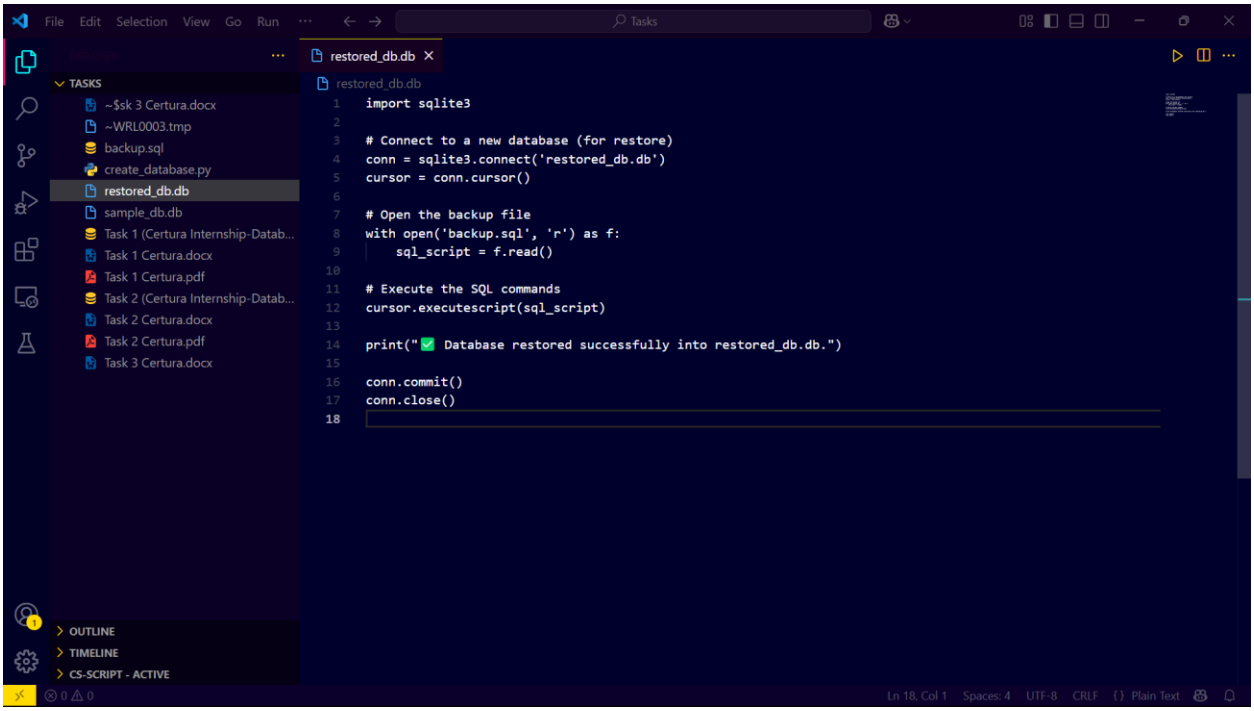
Step 4: Write a Restore Script

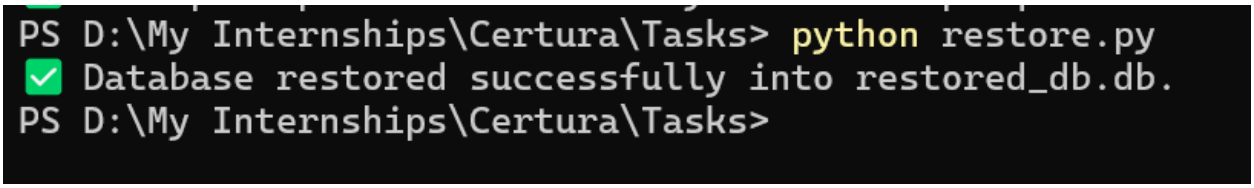
Now, let's write a script to restore from the backup file.

```
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 **restoed_db.db** which is a copy of the original database.



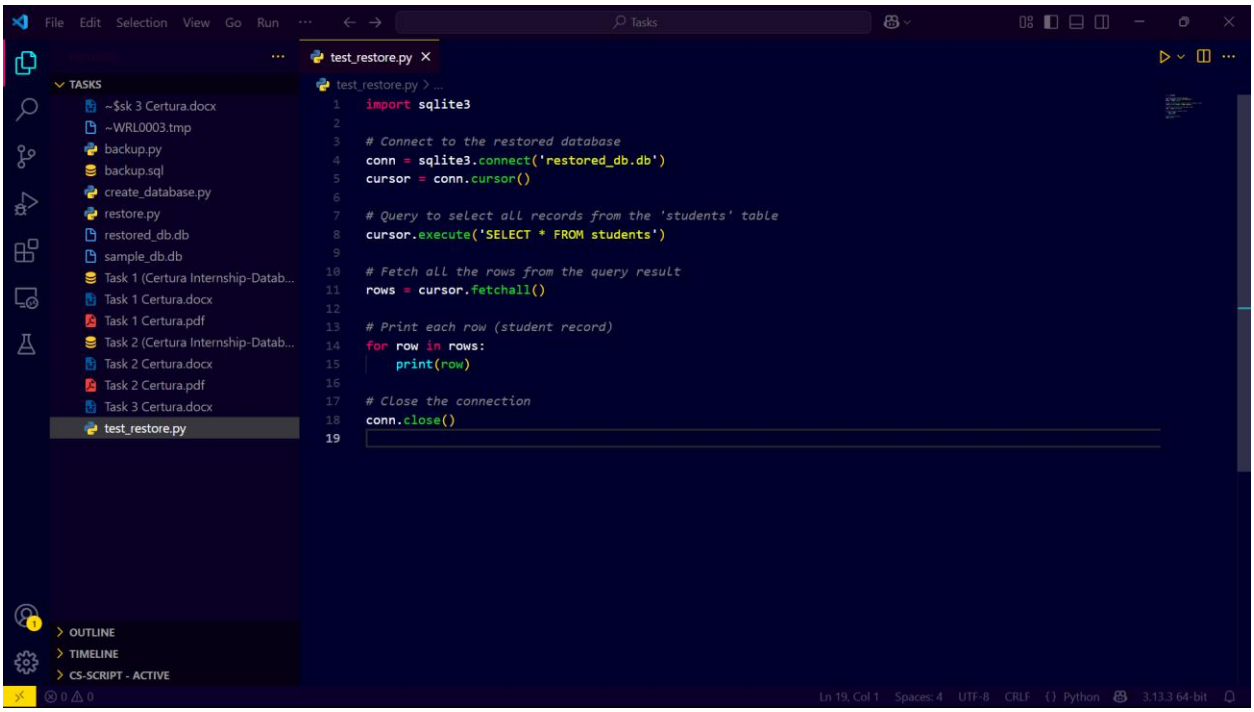


Step 5: Test Backup and Restore

• 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
