

Ex2-1:

1. Goals and Purpose of the Exercise

The main goal of this exercise is to practice how to use the sqlite3 module in Python to create and manage a simple database.

Through this task, the student learns:

- How to create an SQLite database file (doctors.db)
- How to define a table and its columns using SQL commands.
- How to perform CRUD operations (Create, Read, Update, Delete) using Python.

2. Algorithm and Approach Description

Step 1 – Create Database

Connect to a local database file using

```
conn = sqlite3.connect("doctors.db")
```

Use CREATE TABLE IF NOT EXISTS to create the table doctors only once, containing:

```
id INTEGER PRIMARY KEY AUTOINCREMENT,  
first_name TEXT,  
last_name TEXT,  
joining_date TEXT,  
salary REAL,  
address TEXT
```

Step 2 – Insert Data

Use parameterized query to insert data safely:

```
cursor.execute(  
    "INSERT INTO doctors (first_name, last_name, joining_date, salary, address) VALUES (?, ?, ?, ?, ?)"  
    (fn, ln, jd, sal, addr)  
)
```

Step 3 – Select Data

Retrieve all rows and display results:

```
cursor.execute("SELECT * FROM doctors")
rows = cursor.fetchall()
```

Step 4 – Update and Delete

Update salary or name by doctor ID:

```
cursor.execute("UPDATE doctors SET salary=? WHERE id=?", (new_salary, id))
```

Delete a record:

```
cursor.execute("DELETE FROM doctors WHERE id=?", (id,))
```

3. Results and Demonstration

```
$ python ex2-1.py
Connect success!
select statement
(1, 'Hoang', 'Nguyen', '17/10/2025', 100, 'HU')
insert statement
(1, 'Hoang', 'Nguyen', '17/10/2025', 100, 'HU')
(2, 'Hien', 'Nguyen', '20/10/2025', 200, 'SO')
update statement
(1, 'Harry', 'Nguyen', '17/10/2025', 100, 'HU')
(2, 'Hien', 'Nguyen', '20/10/2025', 200, 'SO')
delete statement
(2, 'Hien', 'Nguyen', '20/10/2025', 200, 'SO')
```

Ex2-2:

1. Goals and Purpose of the Exercise

The goal of Exercise 2-2 is to extend the database created in Exercise 2-1 into a web application using Flask and SQLite..

The purpose of this exercise is to help students understand:

- How to use Flask to build a simple dynamic website.
- How to collect data from HTML forms and store it in an SQLite database.
- How to retrieve and display data from the database through a web page.

2. Algorithm and Approach Description

Step 1 – Initialize Flask Application

Import Flask and sqlite3.

Create a Flask app instance:

```
app = Flask(__name__)
```

Step 2 – Create the Database Table

When the app starts, a function create_table() checks if the table doctors exists.

If not, it runs:

```
CREATE TABLE IF NOT EXISTS doctors (  
    id INTEGER PRIMARY KEY AUTOINCREMENT,  
    first_name TEXT,  
    last_name TEXT,  
    joining_date TEXT,  
    salary REAL,  
    address TEXT  
);
```

Step 3 – Define Flask Routes

'/' (Home Page)

Displays a simple HTML form for entering doctor information.

When the user submits the form (POST), data is inserted into the database.

```
@app.route('/', methods=['GET', 'POST'])
def index():
    if request.method == 'POST':
        # get form data and insert to db
```

'/doctors' (List Page)

Displays all doctors from the database in a simple HTML table using:

```
cursor.execute("SELECT * FROM doctors")
```

Step 4 – HTML Templates

The project uses three small HTML files placed in the templates/ folder:

form.html: the input form for adding doctors.

success.html: shown after a successful submission.

list.html: shows all doctor records in a table.

render_template() is used to render these HTML files dynamically:

```
return render_template('list.html', rows=rows)
```

Step 5 – Run the Server

Start the web app locally using:

```
python app.py
```

3. Results and Demonstration

(a) Form Input Page

The home page / allows users to input details such as:

First name, Last name, Joining date, Salary, Address.

When “Submit” is clicked, data is stored in doctors.db.

Thêm thông tin bác sĩ

Họ:

Tên:


Ngày vào làm: 

Lương:

Địa chỉ:

[Xem danh sách bác sĩ](#)

(b) Success Page

 **Thêm bác sĩ thành công!**

[← Quay lại](#)

[Xem danh sách bác sĩ](#)

(c) Doctors List Page

Danh sách bác sĩ

| ID | Họ | Tên | Ngày vào làm | Lương | Địa chỉ |
|----|--------|------|--------------|-------|---------|
| 1 | Nguyen | Hien | 2025-10-17 | 123 | HE |

[← Quay lại thêm bác sĩ](#)