Lab 4

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Roll No:CS24b2002

Part 1: SQLite using Terminal and SQL

Creating tables

```
sqlite> CREATE TABLE Course (
   ...>     course_id INTEGER PRIMARY KEY,
   ...>     course_code TEXT UNIQUE NOT NULL,
   ...>     course_name TEXT NOT NULL,
   ...>     credits INTEGER NOT NULL CHECK (credits > 0)
   ...> );
sqlite> CREATE TABLE Enrollment (
   ...>     student_id INTEGER NOT NULL,
   ...>     course_id INTEGER NOT NULL,
   ...>     enrollment_date TEXT NOT NULL,
   ...>     PRIMARY KEY (student_id, course_id),
   ...>     FOREIGN KEY (student_id) REFERENCES Student(student_id),
   ...>     FOREIGN KEY (course_id) REFERENCES Course(course_id)
   ...> );
```

```
sqlite> CREATE TABLE student (
   ...>     student_id INT PRIMARY KEY,
   ...>     first_name VARCHAR(50) NOT NULL,
   ...>     email VARCHAR(100) NOT NULL UNIQUE,
   ...>     major VARCHAR(50) NOT NULL
   ...> );
sqlite>
sqlite> INSERT INTO student (student_id, first_name, email, major)
   ...> VALUES
   ...> (1001, 'Alice', 'alice.johnson@university.edu', 'Computer Science'),
   ...> (1002, 'Bob', 'bob.smith@university.edu', 'Mathematics'),
   ...> (1003, 'Carol', 'carol.nguyen@university.edu', 'Physics'),
   ...> (1004, 'David', 'david.martinez@university.edu', 'Computer Science'),
   ...> (1005, 'Emma', 'emma.brown@university.edu', 'Biology');
```

Inserting values

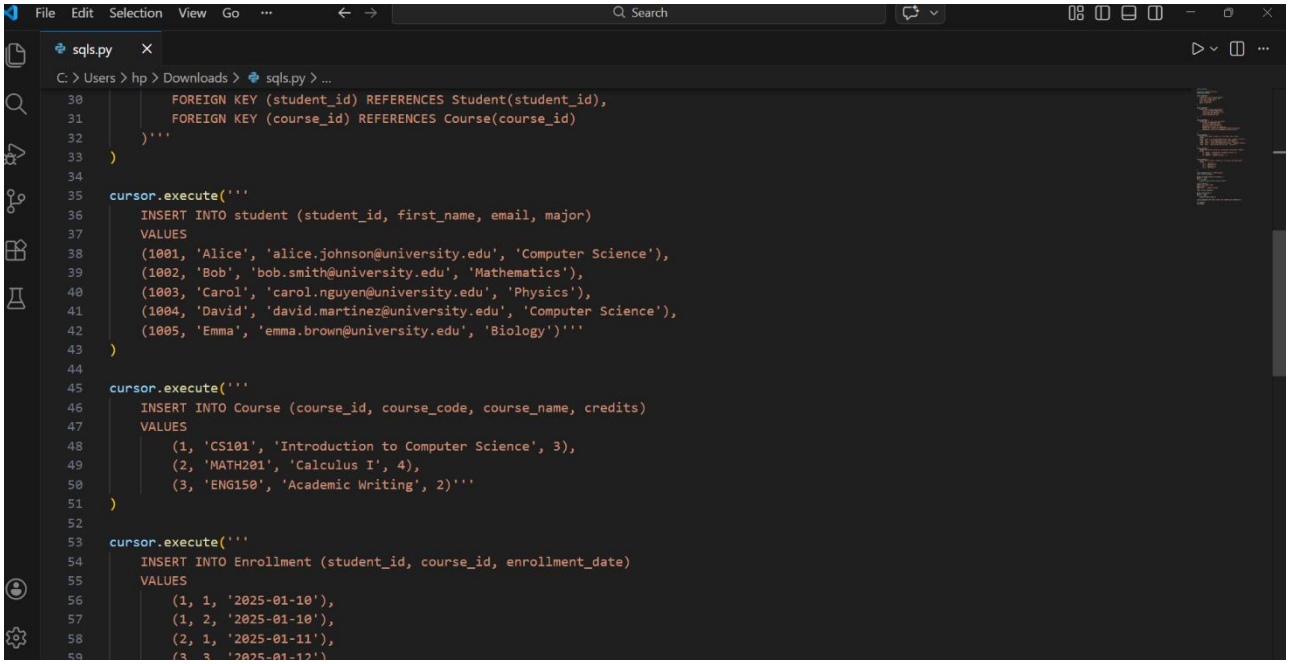
```
sqlite> select * from student;
1001|Alice|alice.johnson@university.edu|Computer Science
1002|Bob|bob.smith@university.edu|Mathematics
1003|Carol|carol.nguyen@university.edu|Physics
1004|David|david.martinez@university.edu|Computer Science
1005|Emma|emma.brown@university.edu|Biology
sqlite> INSERT INTO Course (course_id, course_code, course_name, credits)
   ...> VALUES
   ...>     (1, 'CS101', 'Introduction to Computer Science', 3),
   ...>     (2, 'MATH201', 'Calculus I', 4),
   ...>     (3, 'ENG150', 'Academic Writing', 2);
sqlite> INSERT INTO Enrollment (student_id, course_id, enrollment_date)
   ...> VALUES
   ...>     (1, 1, '2025-01-10'),
   ...>     (1, 2, '2025-01-10'),
   ...>     (2, 1, '2025-01-11'),
   ...>     (3, 3, '2025-01-12');
sqlite> ALTER TABLE Student
   ...> ADD COLUMN date_of_birth TEXT;
sqlite> select * from Course
   ...> ;
1|CS101|Introduction to Computer Science|3
2|MATH201|Calculus I|4
3|ENG150|Academic Writing|2
sqlite> select * from Enrollment;
1|1|2025-01-10
1|2|2025-01-10
2|1|2025-01-11
3|3|2025-01-12
```

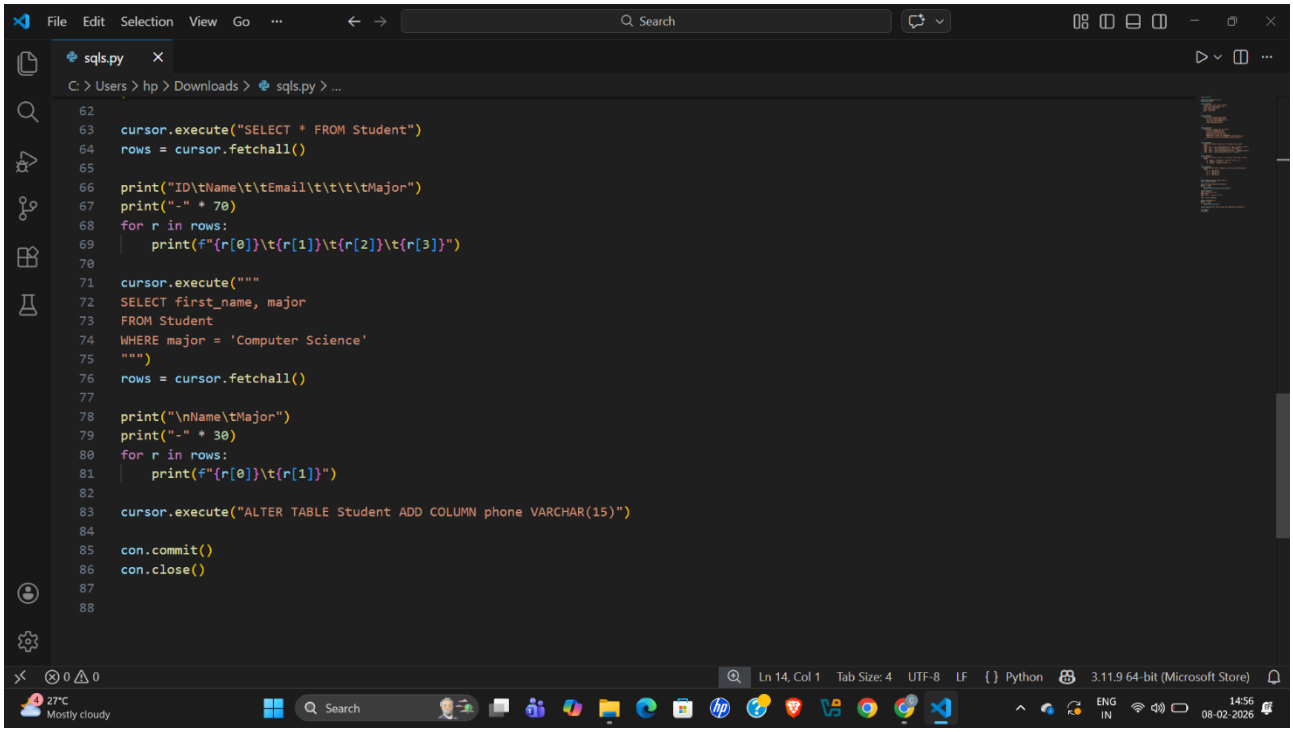
Altering tables and sql commands

```
sqlite> ALTER TABLE Student
   ...> ADD COLUMN date_of_birth TEXT;
sqlite> select * from Course
   ...> ;
1|CS101|Introduction to Computer Science|3
2|MATH201|Calculus I|4
3|ENG150|Academic Writing|2
sqlite> select * from Enrollment;
1|1|2025-01-10
1|2|2025-01-10
2|1|2025-01-11
3|3|2025-01-12
sqlite> select * from student
   ...> ;
1001|Alice|alice.johnson@university.edu|Computer Science|
1002|Bob|bob.smith@university.edu|Mathematics|
1003|Carol|carol.nguyen@university.edu|Physics|
1004|David|david.martinez@university.edu|Computer Science|
1005|Emma|emma.brown@university.edu|Biology|
sqlite> .header on
sqlite> select * from student;
student_id|first_name|email|major|date_of_birth
1001|Alice|alice.johnson@university.edu|Computer Science|
1002|Bob|bob.smith@university.edu|Mathematics|
1003|Carol|carol.nguyen@university.edu|Physics|
1004|David|david.martinez@university.edu|Computer Science|
1005|Emma|emma.brown@university.edu|Biology|
sqlite> UPDATE Student
   ...> SET date_of_birth = '2002-05-14'
   ...> WHERE student_id = 1;
sqlite> select * from student;
student_id|first_name|email|major|date_of_birth
1001|Alice|alice.johnson@university.edu|Computer Science|
1002|Bob|bob.smith@university.edu|Mathematics|
1003|Carol|carol.nguyen@university.edu|Physics|
1004|David|david.martinez@university.edu|Computer Science|
1005|Emma|emma.brown@university.edu|Biology|
sqlite> UPDATE Student
   ...> SET date_of_birth = '2002-05-14'
   ...> WHERE student_id = 1001;
sqlite> select * from student;
student_id|first_name|email|major|date_of_birth
1001|Alice|alice.johnson@university.edu|Computer Science|2002-05-14
1002|Bob|bob.smith@university.edu|Mathematics|
1003|Carol|carol.nguyen@university.edu|Physics|
1004|David|david.martinez@university.edu|Computer Science|
1005|Emma|emma.brown@university.edu|Biology|
```

```
sqlite> select * from student where student_id > 1002;
student_id|first_name|email|major|date_of_birth
1003|Carol|carol.nguyen@university.edu|Physics|
1004|David|david.martinez@university.edu|Computer Science|
1005|Emma|emma.brown@university.edu|Biology|
sqlite>
```

Part 2: Using python


File Edit Selection View Go
Search
sqls.py
C: > Users > hp > Downloads > sqls.py > ...
FOREIGN KEY (student_id) REFERENCES Student(student_id),
FOREIGN KEY (course_id) REFERENCES Course(course_id)
)'''
)
cursor.execute('''
INSERT INTO student (student_id, first_name, email, major)
VALUES
(1001, 'Alice', 'alice.johnson@university.edu', 'Computer Science'),
(1002, 'Bob', 'bob.smith@university.edu', 'Mathematics'),
(1003, 'Carol', 'carol.nguyen@university.edu', 'Physics'),
(1004, 'David', 'david.martinez@university.edu', 'Computer Science'),
(1005, 'Emma', 'emma.brown@university.edu', 'Biology')'''
)
cursor.execute('''
INSERT INTO Course (course_id, course_code, course_name, credits)
VALUES
(1, 'CS101', 'Introduction to Computer Science', 3),
(2, 'MATH201', 'Calculus I', 4),
(3, 'ENG150', 'Academic Writing', 2)'''
)
cursor.execute('''
INSERT INTO Enrollment (student_id, course_id, enrollment_date)
VALUES
(1, 1, '2025-01-10'),
(1, 2, '2025-01-10'),
(2, 1, '2025-01-11'),


File Edit Selection View Go
Search
sqls.py
C: > Users > hp > Downloads > sqls.py > ...
cursor.execute("SELECT * FROM Student")
rows = cursor.fetchall()
print("ID\tName\t\tEmail\t\t\t\tMajor")
print("-" * 70)
for r in rows:
print(f"{r[0]}\t{r[1]}\t{r[2]}\t{r[3]}")
cursor.execute("""
SELECT first_name, major
FROM Student
WHERE major = 'Computer Science'
""")
rows = cursor.fetchall()
print("\nName\tMajor")
print("-" * 30)
for r in rows:
print(f"{r[0]}\t{r[1]}")
cursor.execute("ALTER TABLE Student ADD COLUMN phone VARCHAR(15)")
con.commit()
con.close()
Ln 14, Col 1
Tab Size: 4
UTF-8
LF
{ } Python
3.11.9 64-bit (Microsoft Store)
27°C
Mostly cloudy
Search
ENG
IN
14:56
08-02-2026

```
PS C:\Users\hp\downloads> python sqls.py
ID      Name            Email                           Major
-----------------------------------------------------------------------
1001    Alice   alice.johnson@university.edu    Computer Science
1002    Bob     bob.smith@university.edu        Mathematics
1003    Carol   carol.nguyen@university.edu     Physics
1004    David   david.martinez@university.edu   Computer Science
1005    Emma    emma.brown@university.edu       Biology

Name    Major
------------------------------
Alice   Computer Science
David   Computer Science
PS C:\Users\hp\downloads>
```