Lesson 05 Demo 06

Working with Subqueries and Keys

Objective: To demonstrate how to effectively utilize subqueries and work with different types of keys in MySQL for complex data operations

Tools required: MySQL

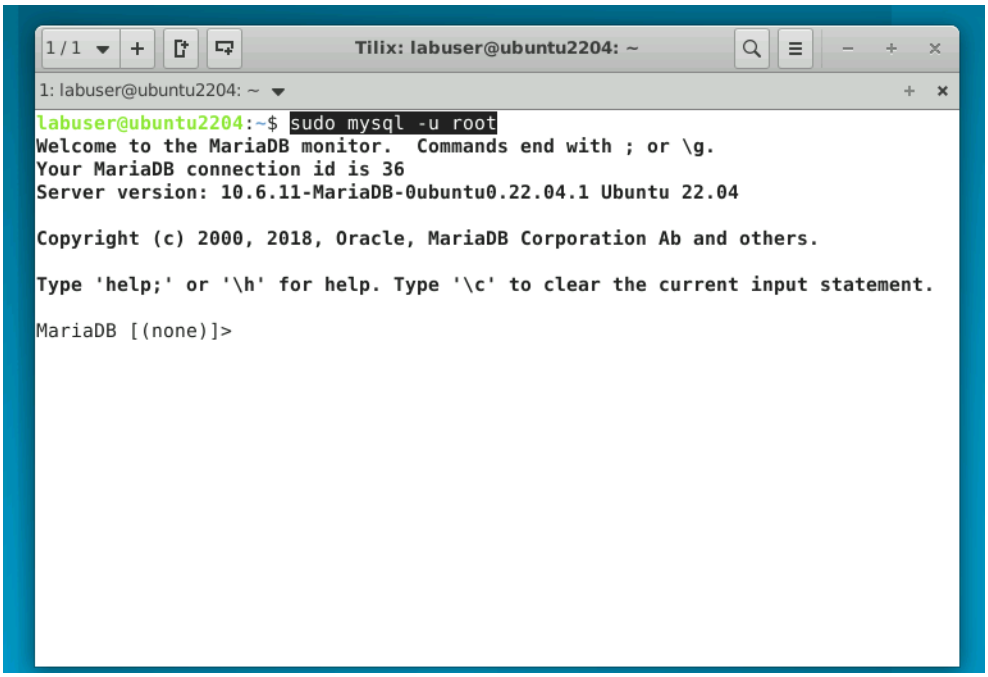
Prerequisites: None

Steps to be followed:

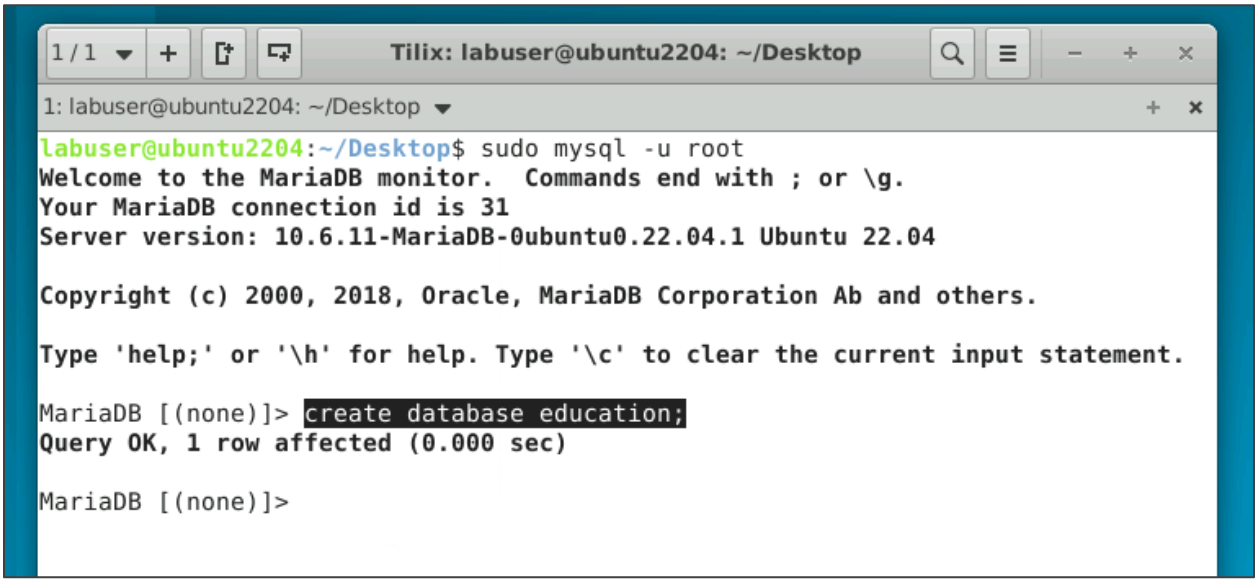
1. Set up a database and table
2. Insert data with a subquery
3. Use subqueries in the SELECT statement
4. Work with keys

Step 1: Set up a database and table

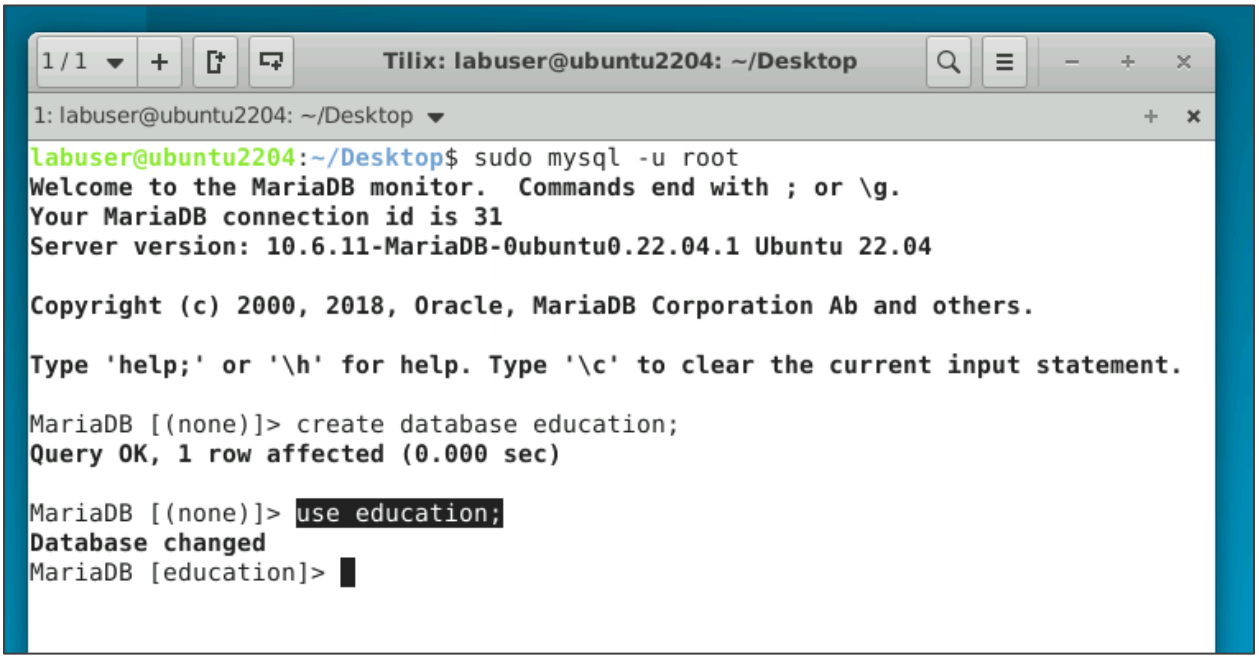
1.1 Open a terminal window and access MySQL as root user:
sudo mysql -u root



1.2 Create a new database named **education**:
create database education;

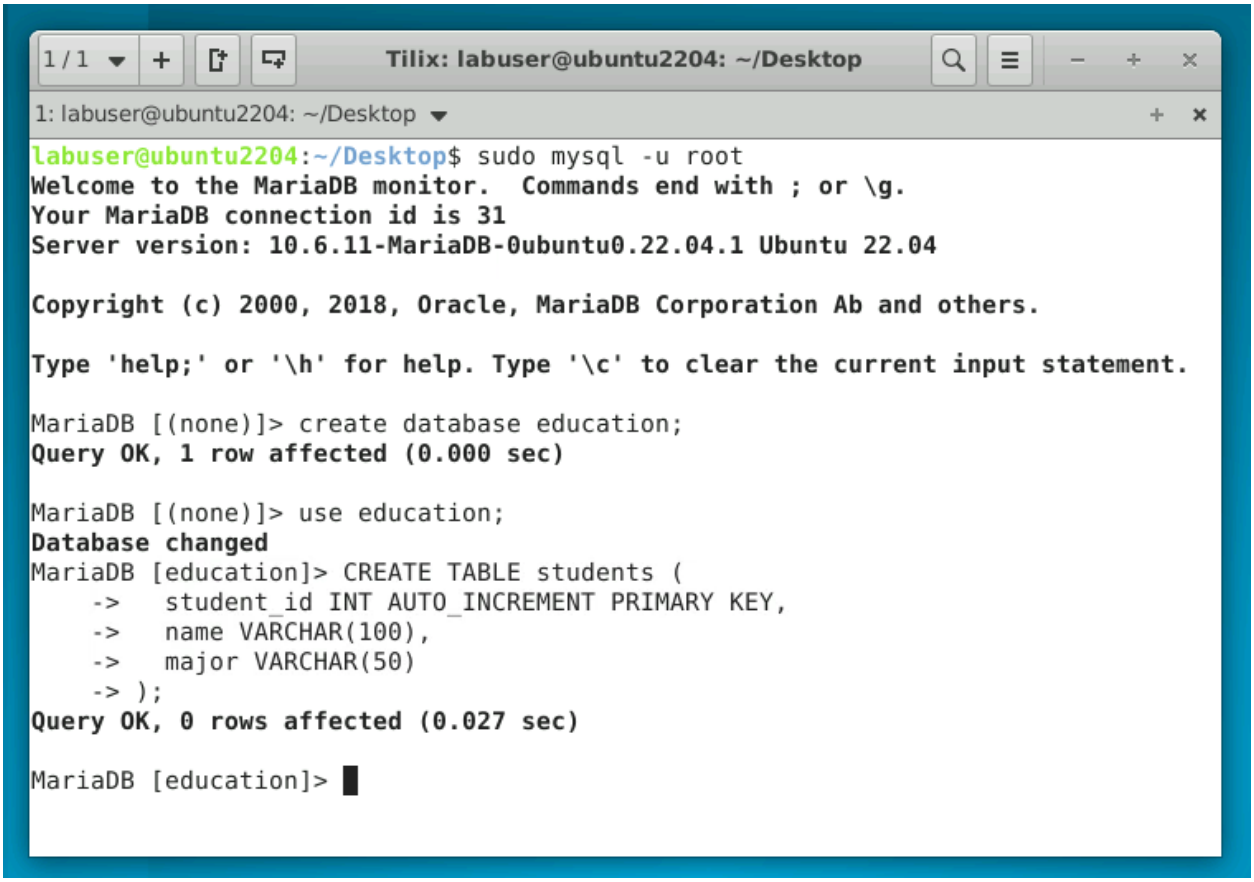


1.3 Select the **education** database:
use education;



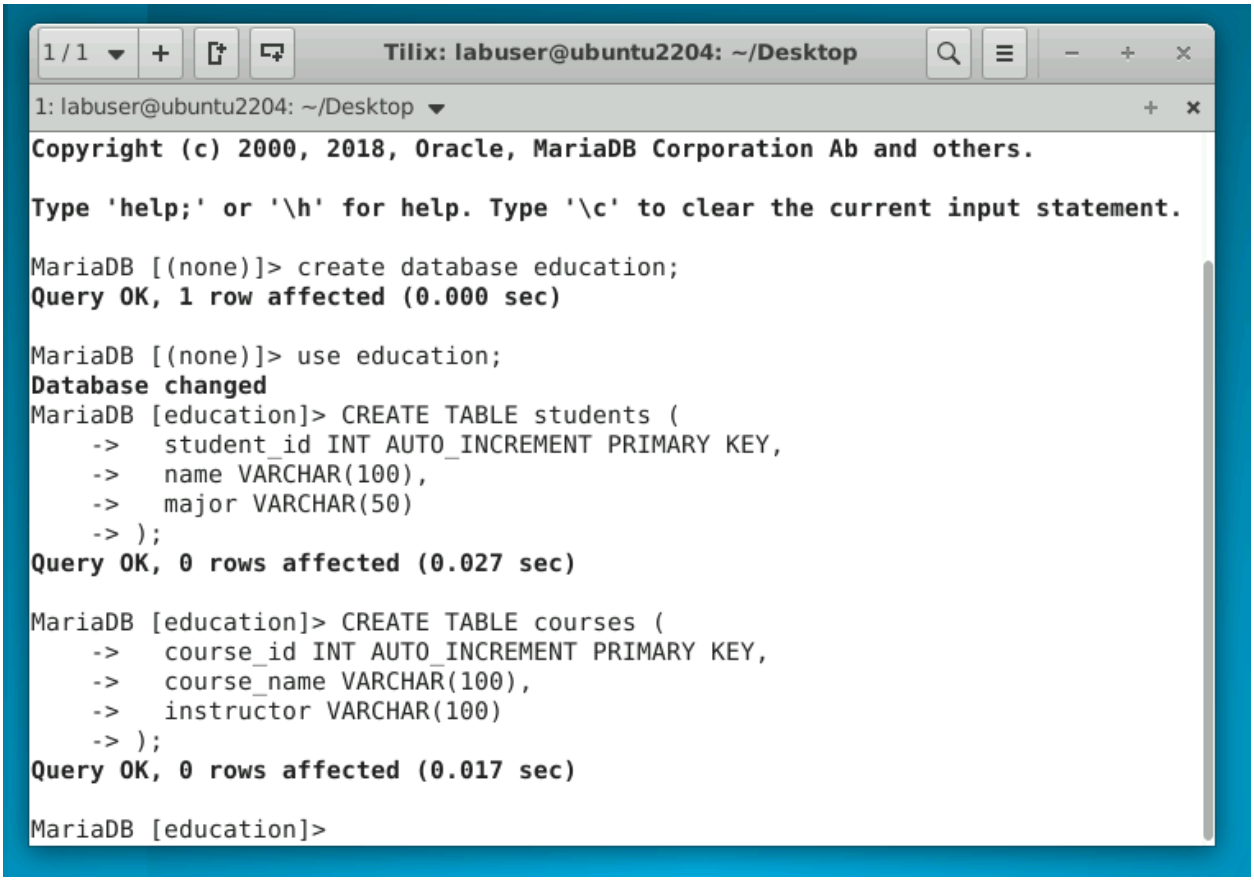
1.4 Create a **students** table with relevant fields:

```
CREATE TABLE students (
  student_id INT AUTO_INCREMENT PRIMARY KEY,
  name VARCHAR(100),
  major VARCHAR(50)
);
```



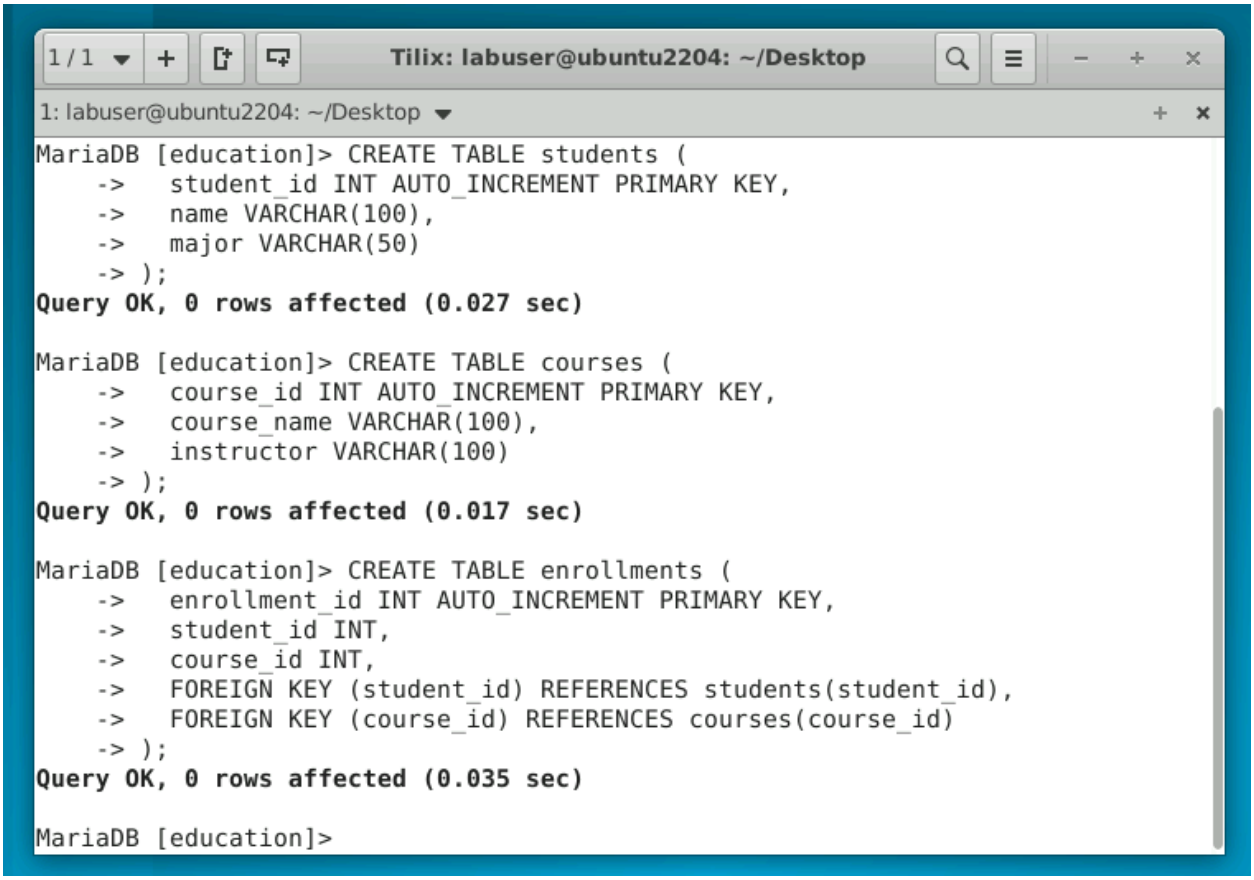
1.5 Create a **courses** table with relevant fields:

```
CREATE TABLE courses (
  course_id INT AUTO_INCREMENT PRIMARY KEY,
  course_name VARCHAR(100),
  instructor VARCHAR(100)
);
```



1.6 Create an **enrollments** table to link **students** with **courses**:

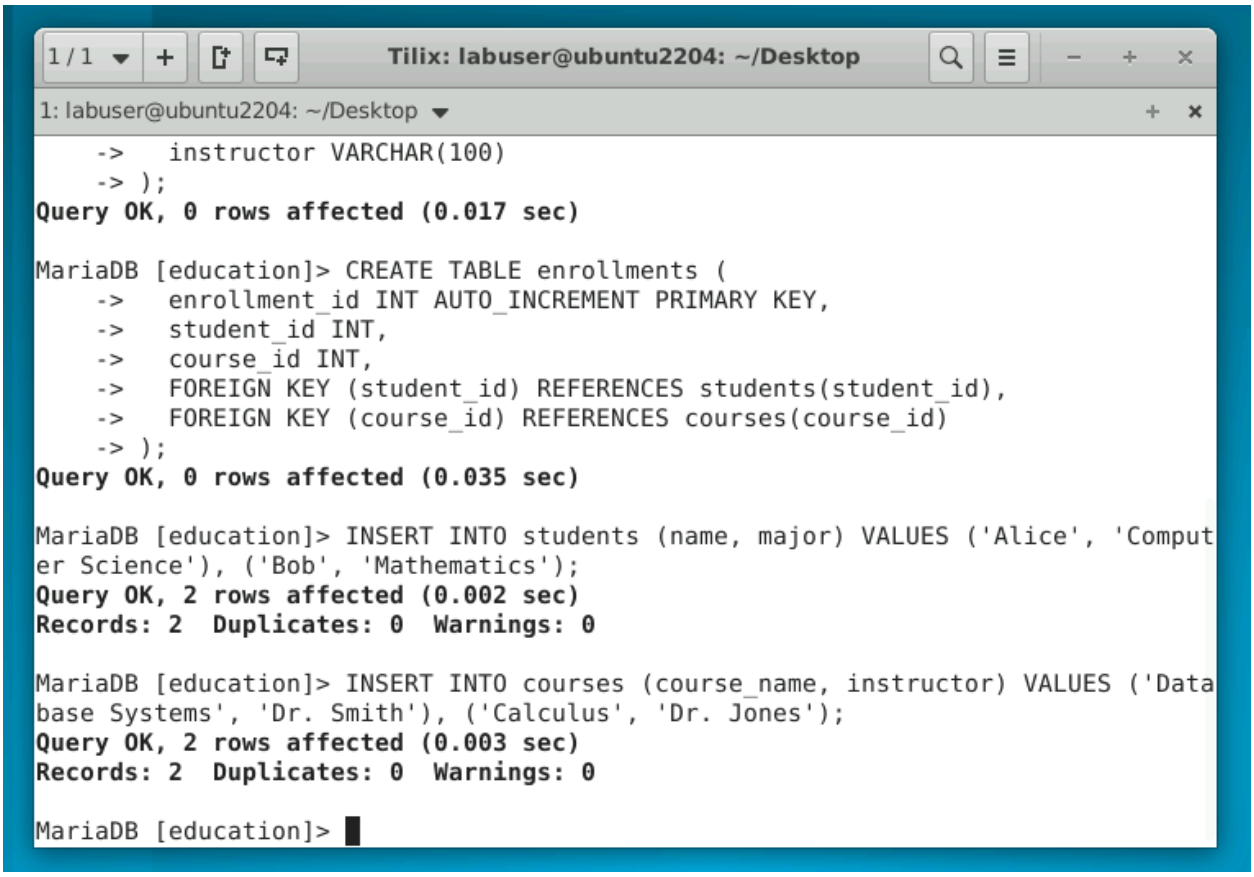
```
CREATE TABLE enrollments (
  enrollment_id INT AUTO_INCREMENT PRIMARY KEY,
  student_id INT,
  course_id INT,
  FOREIGN KEY (student_id) REFERENCES students(student_id),
  FOREIGN KEY (course_id) REFERENCES courses(course_id)
);
```



1.7 Insert data into the **students** and **courses** tables:

INSERT INTO students (name, major) VALUES ('Alice', 'Computer Science'), ('Bob', 'Mathematics');

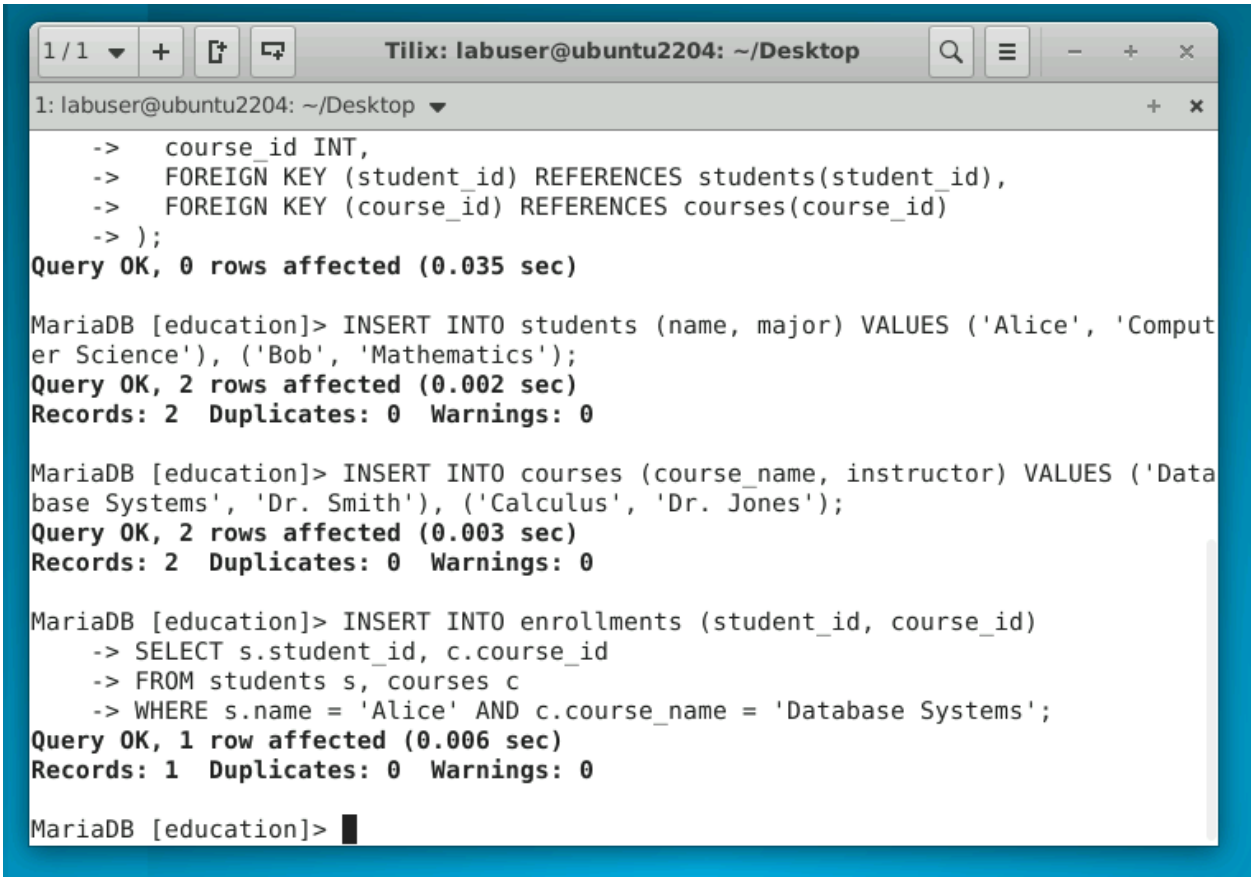
INSERT INTO courses (course_name, instructor) VALUES ('Database Systems', 'Dr. Smith'), ('Calculus', 'Dr. Jones');



Step 2: Insert data with a subquery

2.1 Insert data into the **enrollments** table using a subquery:

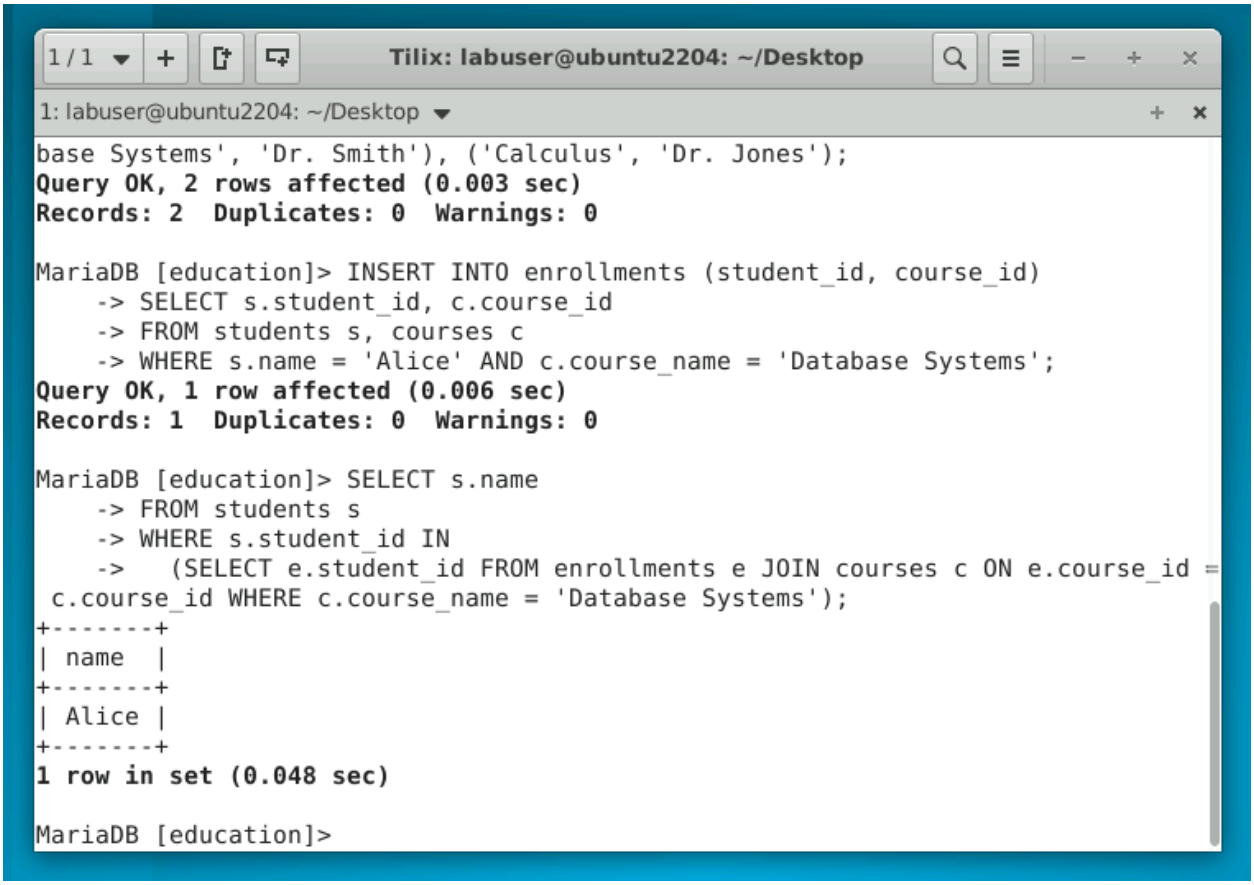
```
INSERT INTO enrollments (student_id, course_id)
SELECT s.student_id, c.course_id
FROM students s, courses c
WHERE s.name = 'Alice' AND c.course_name = 'Database Systems';
```



Step 3: Use subqueries in the SELECT statement

3.1 Retrieve students enrolled for the **Database Systems** course:

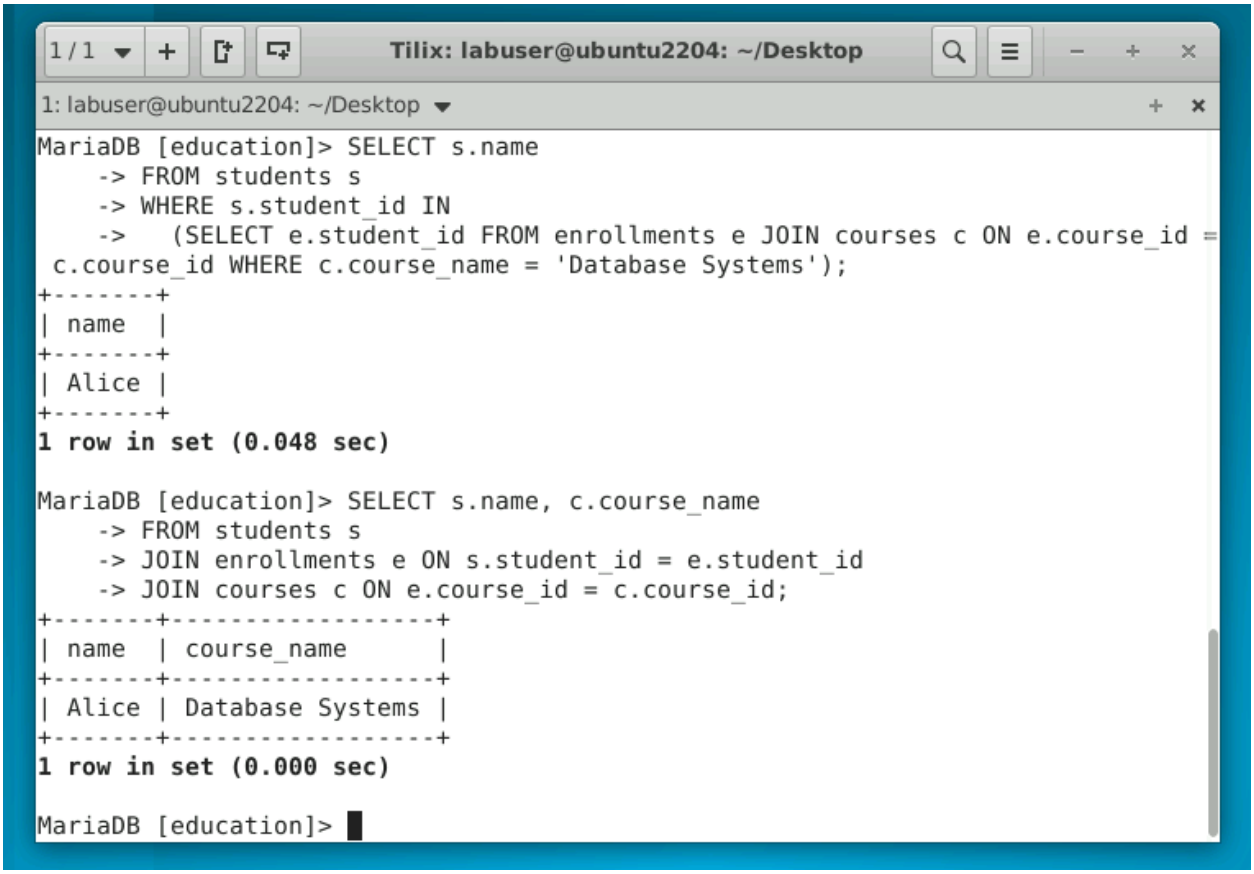
```
SELECT s.name
FROM students s
WHERE s.student_id IN
  (SELECT e.student_id FROM enrollments e JOIN courses c ON e.course_id =
c.course_id WHERE c.course_name = 'Database Systems');
```



Step 4: Work with keys

4.1 Demonstrate a JOIN operation using foreign keys:

SELECT s.name, c.course_name
FROM students s
JOIN enrollments e ON s.student_id = e.student_id
JOIN courses c ON e.course_id = c.course_id;



By following these steps, you have successfully learned how to utilize subqueries within SELECT statements and work effectively with different types of keys, such as primary and foreign keys.