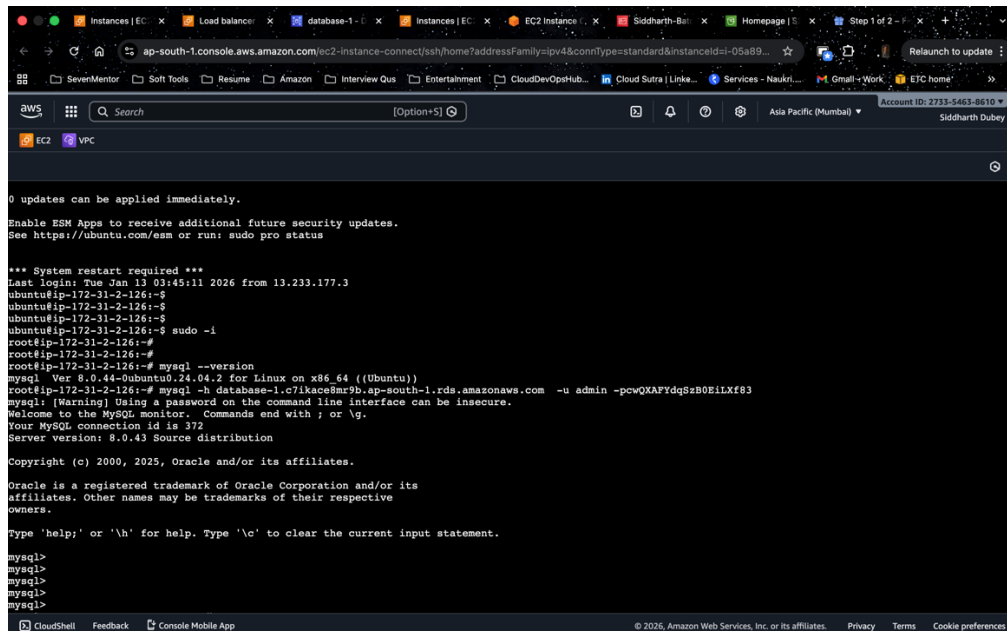


Practical 7: EC2 SQL Proxy + RDS MySQL Connection via Endpoint

Minor Project 1: Online Course Management System

0. Setup RDS and MySQL Database



```
0 updates can be applied immediately.
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

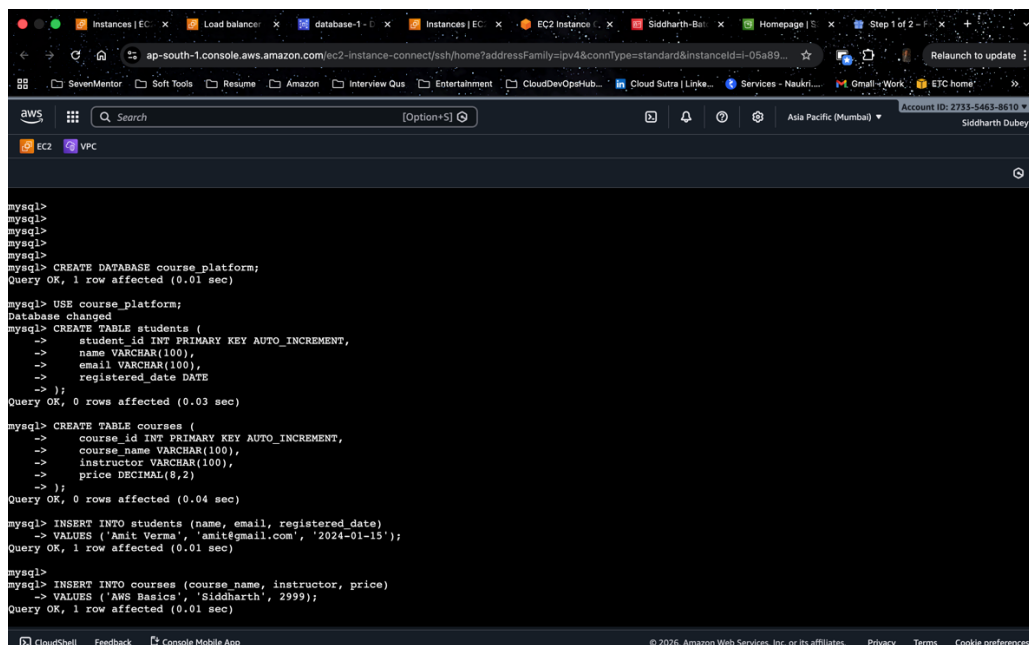
*** System restart required ***
Last login: Tue Jan 13 03:45:11 2026 from 13.233.177.3
ubuntu@ip-172-31-2-126:~$
ubuntu@ip-172-31-2-126:~$
ubuntu@ip-172-31-2-126:~$ sudo -i
root@ip-172-31-2-126:~#
root@ip-172-31-2-126:~#
root@ip-172-31-2-126:~# mysql --version
mysql Ver 8.0.44-0ubuntu0.24.04.2 for Linux on x86_64 ((Ubuntu))
root@ip-172-31-2-126:~# mysql -h database-1.c7ikace8mr9b.ap-south-1.rds.amazonaws.com -u admin -pcwQXAFYdgSzB0EILXf83
mysql: [Warning] Using a password on the command line interface can be insecure.
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 372
Server version: 8.0.43 Source distribution

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
mysql>
mysql>
mysql>
mysql>
```

1. CREATE DATABASE
2. USE
3. CREATE TABLE – Students
4. CREATE TABLE – Courses
5. INSERT



```
mysql>
mysql>
mysql>
mysql>
mysql>
mysql> CREATE DATABASE course_platform;
Query OK, 1 row affected (0.01 sec)

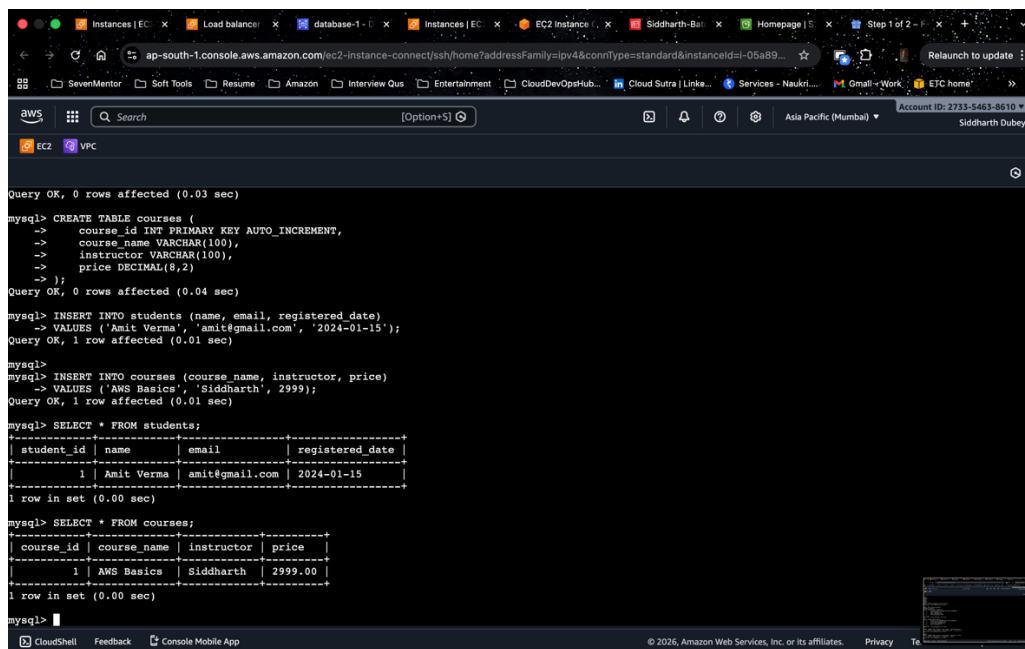
mysql> USE course_platform;
Database changed
mysql> CREATE TABLE students (
  ->   student_id INT PRIMARY KEY AUTO_INCREMENT,
  ->   name VARCHAR(100),
  ->   email VARCHAR(100),
  ->   registered_date DATE
  -> );
Query OK, 0 rows affected (0.03 sec)

mysql> CREATE TABLE courses (
  ->   course_id INT PRIMARY KEY AUTO_INCREMENT,
  ->   course_name VARCHAR(100),
  ->   instructor VARCHAR(100),
  ->   price DECIMAL(8,2)
  -> );
Query OK, 0 rows affected (0.04 sec)

mysql> INSERT INTO students (name, email, registered_date)
  -> VALUES ('Amit Verma', 'amit@gmail.com', '2024-01-15');
Query OK, 1 row affected (0.01 sec)

mysql>
mysql> INSERT INTO courses (course_name, instructor, price)
  -> VALUES ('AWS Basics', 'Siddharth', 2999);
Query OK, 1 row affected (0.01 sec)
```

6. SELECT



```
Query OK, 0 rows affected (0.03 sec)

mysql> CREATE TABLE courses (
  ->   course_id INT PRIMARY KEY AUTO_INCREMENT,
  ->   course_name VARCHAR(100),
  ->   instructor VARCHAR(100),
  ->   price DECIMAL(8,2)
  -> );
Query OK, 0 rows affected (0.04 sec)

mysql> INSERT INTO students (name, email, registered_date)
  -> VALUES ('Amit Verma', 'amit@gmail.com', '2024-01-15');
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO courses (course_name, instructor, price)
  -> VALUES ('AWS Basics', 'Siddharth', 2999);
Query OK, 1 row affected (0.01 sec)

mysql> SELECT * FROM students;
+-----+-----+-----+-----+
| student_id | name      | email          | registered_date |
+-----+-----+-----+-----+
| 1          | Amit Verma | amit@gmail.com | 2024-01-15     |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> SELECT * FROM courses;
+-----+-----+-----+-----+
| course_id | course_name | instructor | price |
+-----+-----+-----+-----+
| 1         | AWS Basics | Siddharth  | 2999.00 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

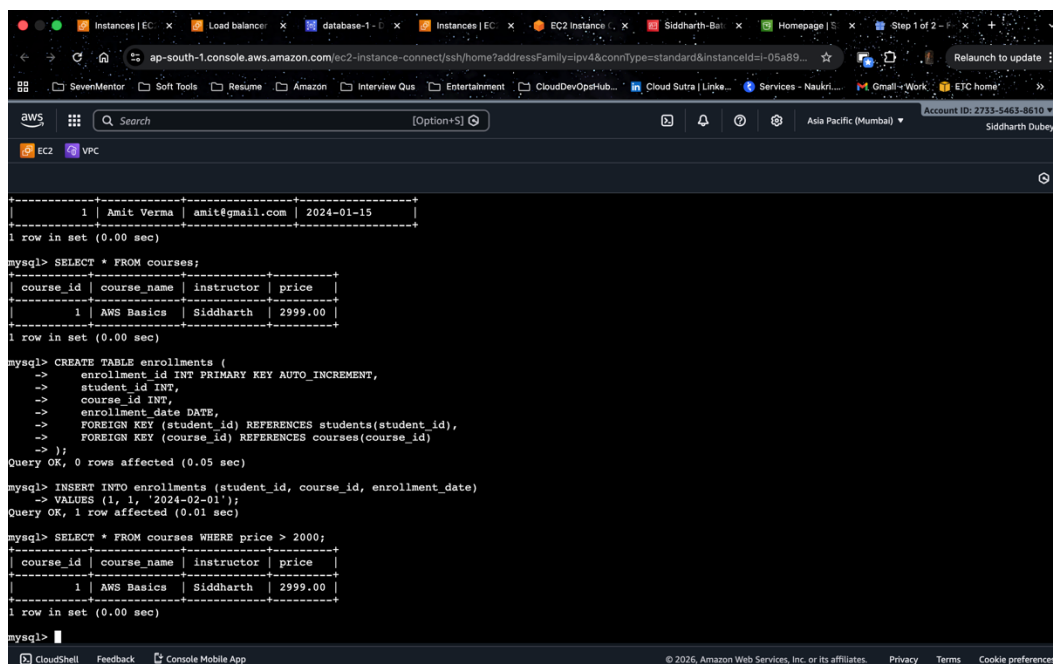
mysql>
```

7. CREATE TABLE – Enrollments (Relationship)

8. INSERT with Foreign Key

9. WHERE

10. UPDATE



```
+-----+-----+-----+-----+
| 1          | Amit Verma | amit@gmail.com | 2024-01-15     |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> SELECT * FROM courses;
+-----+-----+-----+-----+
| course_id | course_name | instructor | price |
+-----+-----+-----+-----+
| 1         | AWS Basics | Siddharth  | 2999.00 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> CREATE TABLE enrollments (
  ->   enrollment_id INT PRIMARY KEY AUTO_INCREMENT,
  ->   student_id INT,
  ->   course_id INT,
  ->   enrollment_date DATE,
  ->   FOREIGN KEY (student_id) REFERENCES students(student_id),
  ->   FOREIGN KEY (course_id) REFERENCES courses(course_id)
  -> );
Query OK, 0 rows affected (0.05 sec)

mysql> INSERT INTO enrollments (student_id, course_id, enrollment_date)
  -> VALUES (1, 1, '2024-02-01');
Query OK, 1 row affected (0.01 sec)

mysql> SELECT * FROM courses WHERE price > 2000;
+-----+-----+-----+-----+
| course_id | course_name | instructor | price |
+-----+-----+-----+-----+
| 1         | AWS Basics | Siddharth  | 2999.00 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

11. DELETE
12. JOIN
13. COUNT
14. ORDER BY

```
Rows matched: 1 Changed: 1 Warnings: 0

mysql> DELETE FROM enrollments WHERE enrollment_id = 3;
Query OK, 0 rows affected (0.01 sec)

mysql> SELECT s.name, c.course_name, e.enrollment_date
-> FROM enrollments e
-> JOIN students s ON e.student_id = s.student_id
-> JOIN courses c ON e.course_id = c.course_id;
+-----+-----+-----+
| name      | course_name | enrollment_date |
+-----+-----+-----+
| Amit Verma | AWS Basics | 2024-02-01      |
+-----+-----+-----+
1 row in set (0.00 sec)

mysql> SELECT c.course_name, COUNT(e.student_id) AS total_students
-> FROM enrollments e
-> JOIN courses c ON e.course_id = c.course_id
-> GROUP BY c.course_name;
+-----+-----+
| course_name | total_students |
+-----+-----+
| AWS Basics | 1              |
+-----+-----+
1 row in set (0.00 sec)

mysql> SELECT * FROM courses ORDER BY price DESC;
+-----+-----+-----+-----+
| course_id | course_name | instructor | price |
+-----+-----+-----+-----+
| 1         | AWS Basics | Siddharth | 2499.00 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

15. LIMIT
16. SUBQUERY
17. VIEW
18. INDEX
19. DISTINCT
20. EXPLAIN

```
-> );
+-----+-----+-----+-----+
| course_id | course_name | instructor | price |
+-----+-----+-----+-----+
| 1         | AWS Basics | Siddharth | 2499.00 |
+-----+-----+-----+-----+
1 row in set (0.01 sec)

mysql> CREATE VIEW enrolled_students_view AS
-> SELECT s.name, c.course_name
-> FROM enrollments e
-> JOIN students s ON e.student_id = s.student_id
-> JOIN courses c ON e.course_id = c.course_id;
Query OK, 0 rows affected (0.01 sec)

mysql> CREATE INDEX idx_course_price ON courses(price);
Query OK, 0 rows affected (0.06 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> SELECT DISTINCT instructor FROM courses;
+-----+
| instructor |
+-----+
| Siddharth  |
+-----+
1 row in set (0.01 sec)

mysql> EXPLAIN SELECT * FROM courses WHERE price > 2000;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| id | select_type | table | partitions | type | possible_keys | key | key_len | ref | rows | filtered | Extra |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1  | SIMPLE     | courses | NULL       | range | idx_course_price | idx_course_price | 5      | NULL | 1    | 100.00   | Using index condition |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set, 1 warning (0.00 sec)

mysql>
```

- Designed relational database schema for students, courses, and enrollments
- Implemented CRUD operations and relational joins
- Generated reports using GROUP BY, COUNT, and subqueries
- Optimized queries using indexing and EXPLAIN
- Created views for simplified data access
- **Tech Used:** MySQL | SQL | Relational Database Design