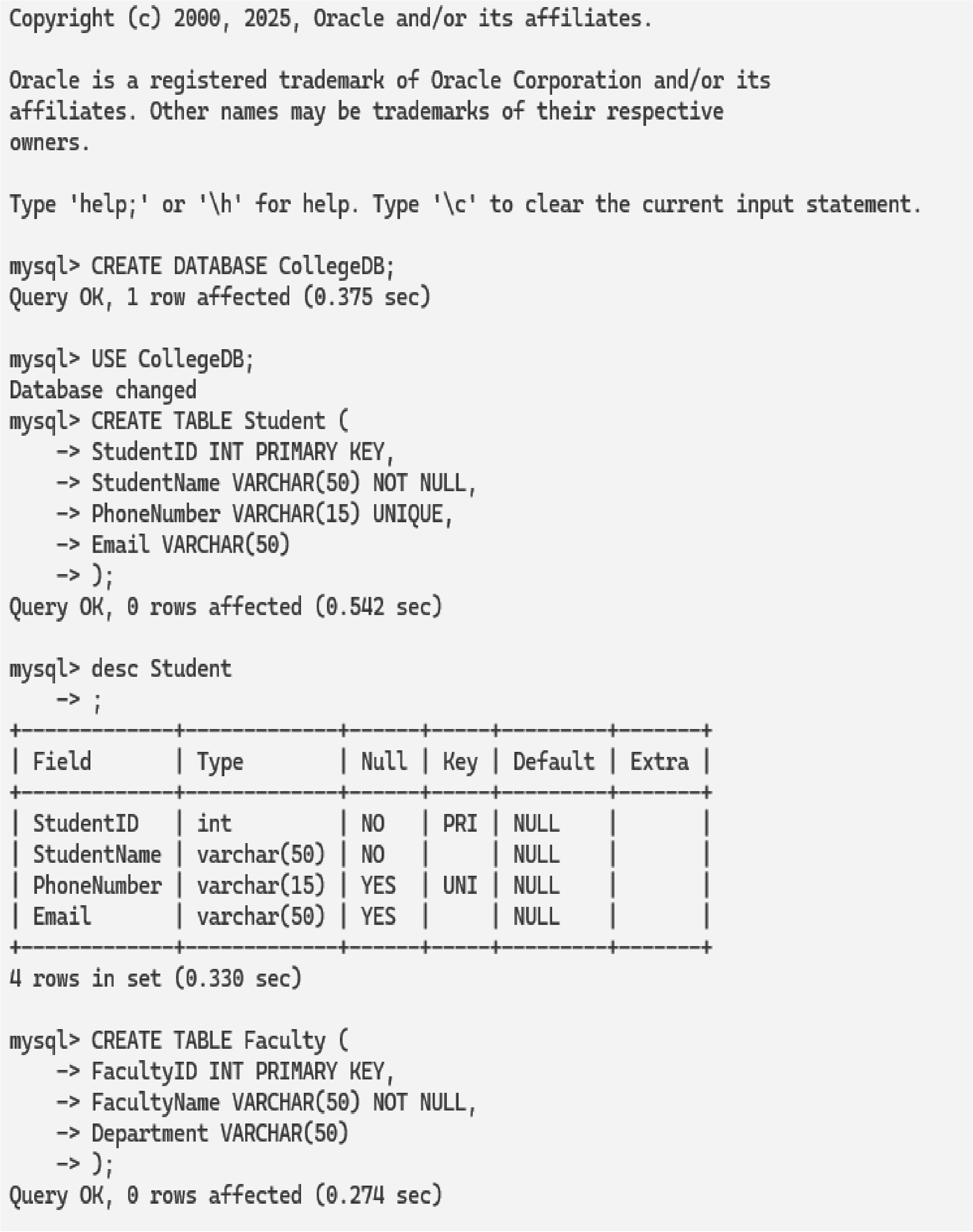
PRACTICAL NO:04



```
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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> CREATE DATABASE CollegeDB;
Query OK, 1 row affected (0.375 sec)

mysql> USE CollegeDB;
Database changed
mysql> CREATE TABLE Student (
    -> StudentID INT PRIMARY KEY,
    -> StudentName VARCHAR(50) NOT NULL,
    -> PhoneNumber VARCHAR(15) UNIQUE,
    -> Email VARCHAR(50)
    -> );
Query OK, 0 rows affected (0.542 sec)

mysql> desc Student
    -> ;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| StudentID   | int         | NO   | PRI | NULL    |       |
| StudentName | varchar(50) | NO   |     | NULL    |       |
| PhoneNumber | varchar(15) | YES  | UNI | NULL    |       |
| Email       | varchar(50) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
4 rows in set (0.330 sec)

mysql> CREATE TABLE Faculty (
    -> FacultyID INT PRIMARY KEY,
    -> FacultyName VARCHAR(50) NOT NULL,
    -> Department VARCHAR(50)
    -> );
Query OK, 0 rows affected (0.274 sec)
```
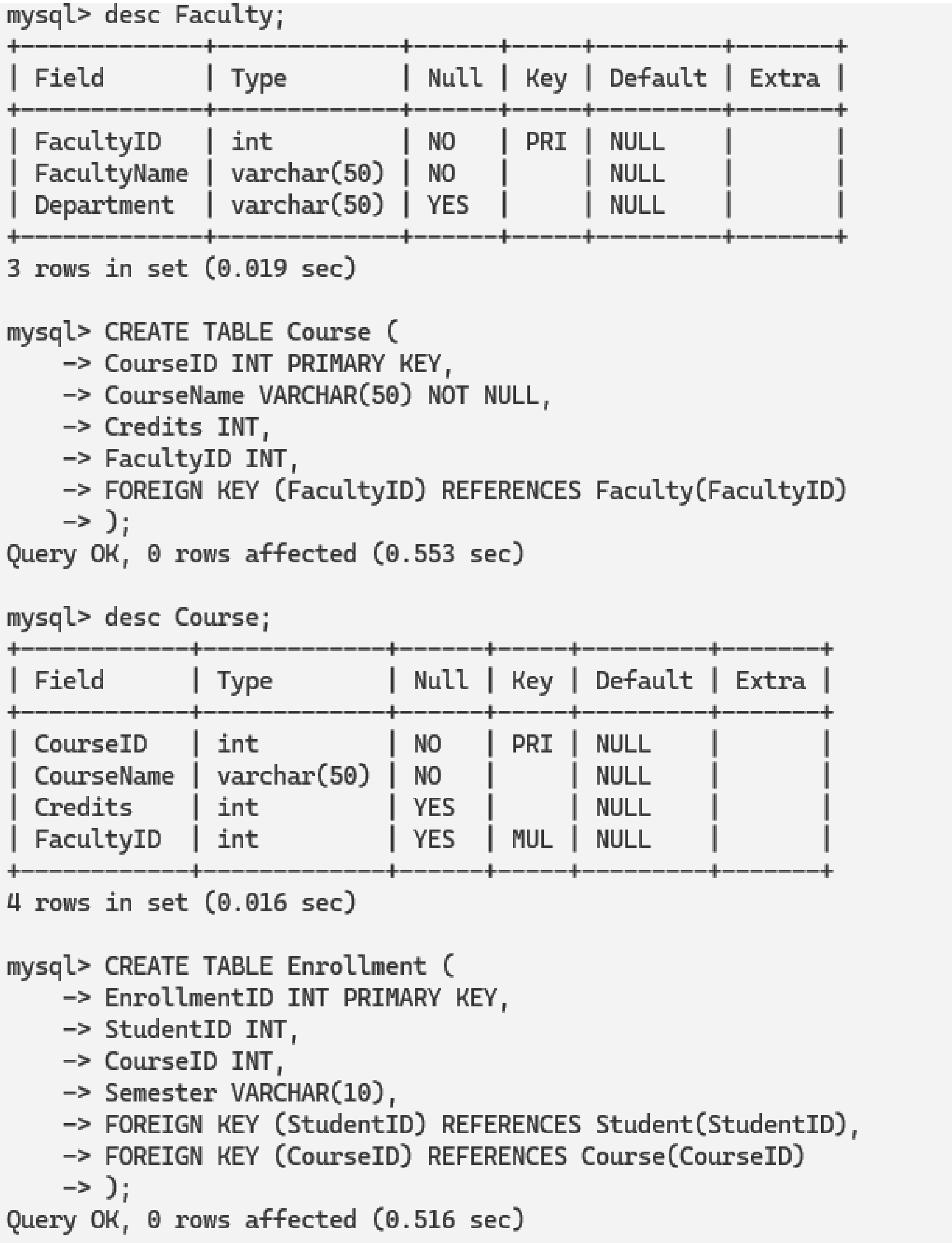
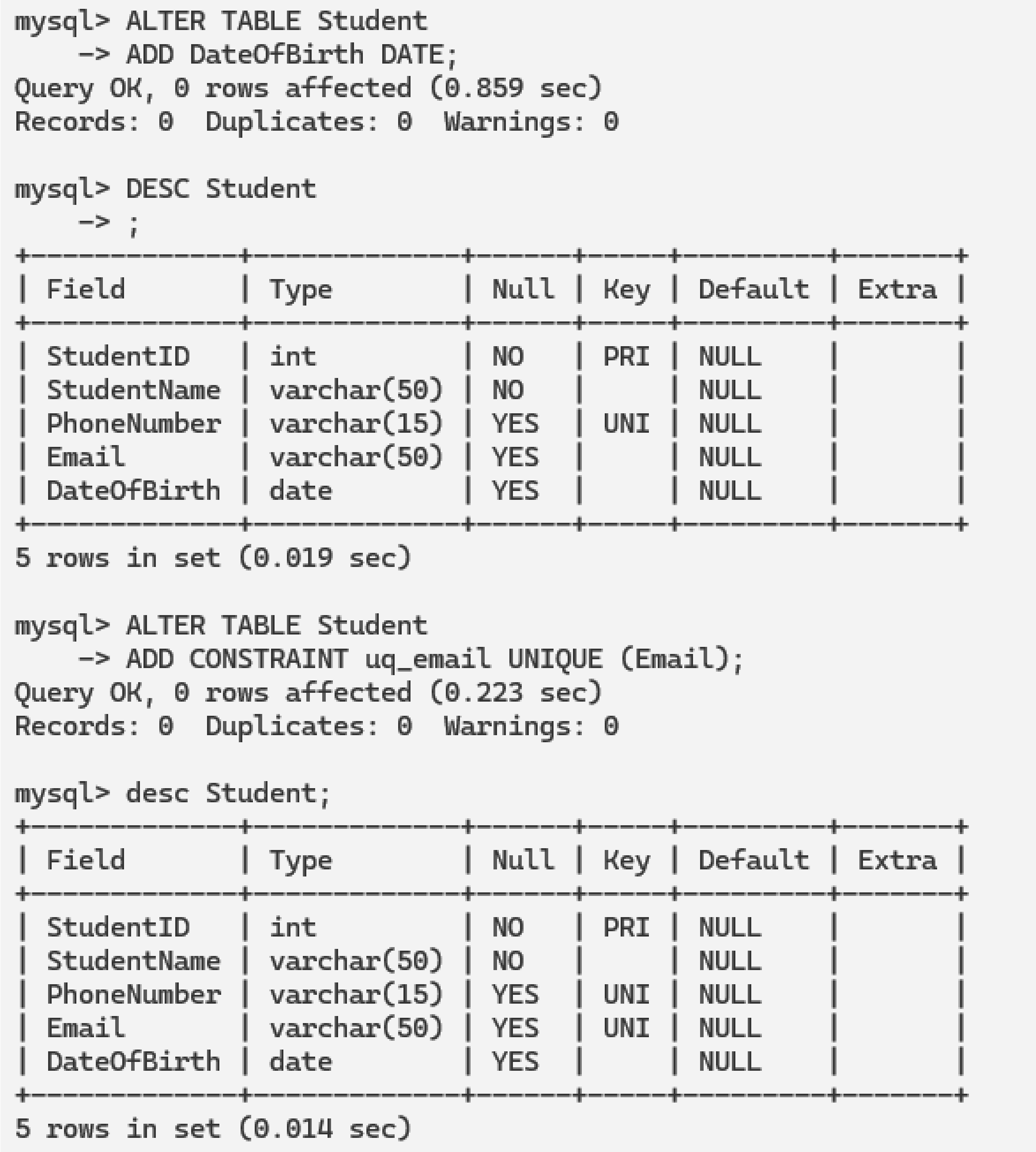
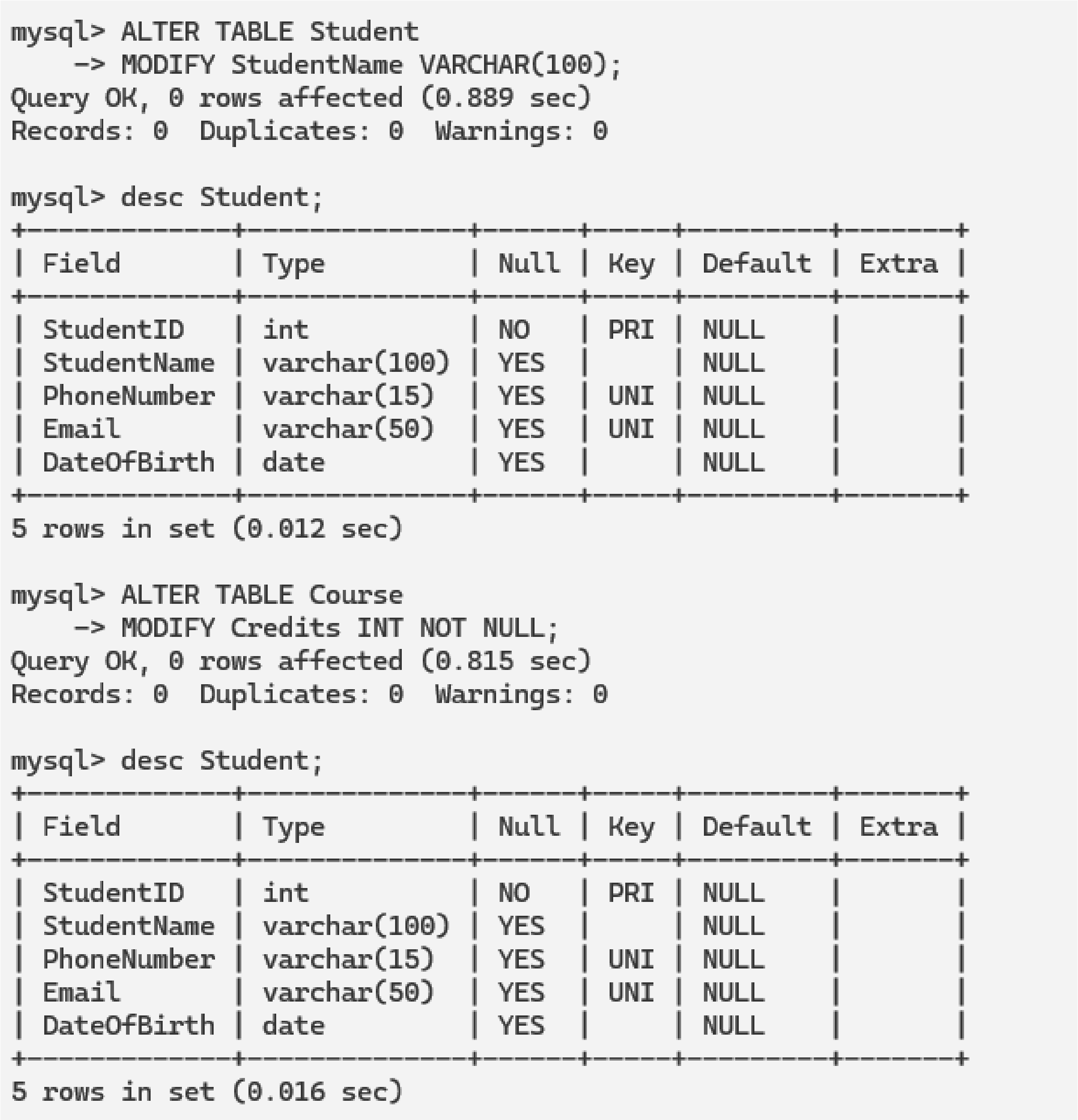



```
mysql> desc Faculty;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| FacultyID   | int         | NO   | PRI | NULL    |       |
| FacultyName | varchar(50) | NO   |     | NULL    |       |
| Department  | varchar(50) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
3 rows in set (0.019 sec)

mysql> CREATE TABLE Course (
    -> CourseID INT PRIMARY KEY,
    -> CourseName VARCHAR(50) NOT NULL,
    -> Credits INT,
    -> FacultyID INT,
    -> FOREIGN KEY (FacultyID) REFERENCES Faculty(FacultyID)
    -> );
Query OK, 0 rows affected (0.553 sec)

mysql> desc Course;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| CourseID   | int         | NO   | PRI | NULL    |       |
| CourseName | varchar(50) | NO   |     | NULL    |       |
| Credits    | int         | YES  |     | NULL    |       |
| FacultyID  | int         | YES  | MUL | NULL    |       |
+------------+-------------+------+-----+---------+-------+
4 rows in set (0.016 sec)

mysql> CREATE TABLE Enrollment (
    -> EnrollmentID INT PRIMARY KEY,
    -> StudentID INT,
    -> CourseID INT,
    -> Semester VARCHAR(10),
    -> FOREIGN KEY (StudentID) REFERENCES Student(StudentID),
    -> FOREIGN KEY (CourseID) REFERENCES Course(CourseID)
    -> );
Query OK, 0 rows affected (0.516 sec)
```

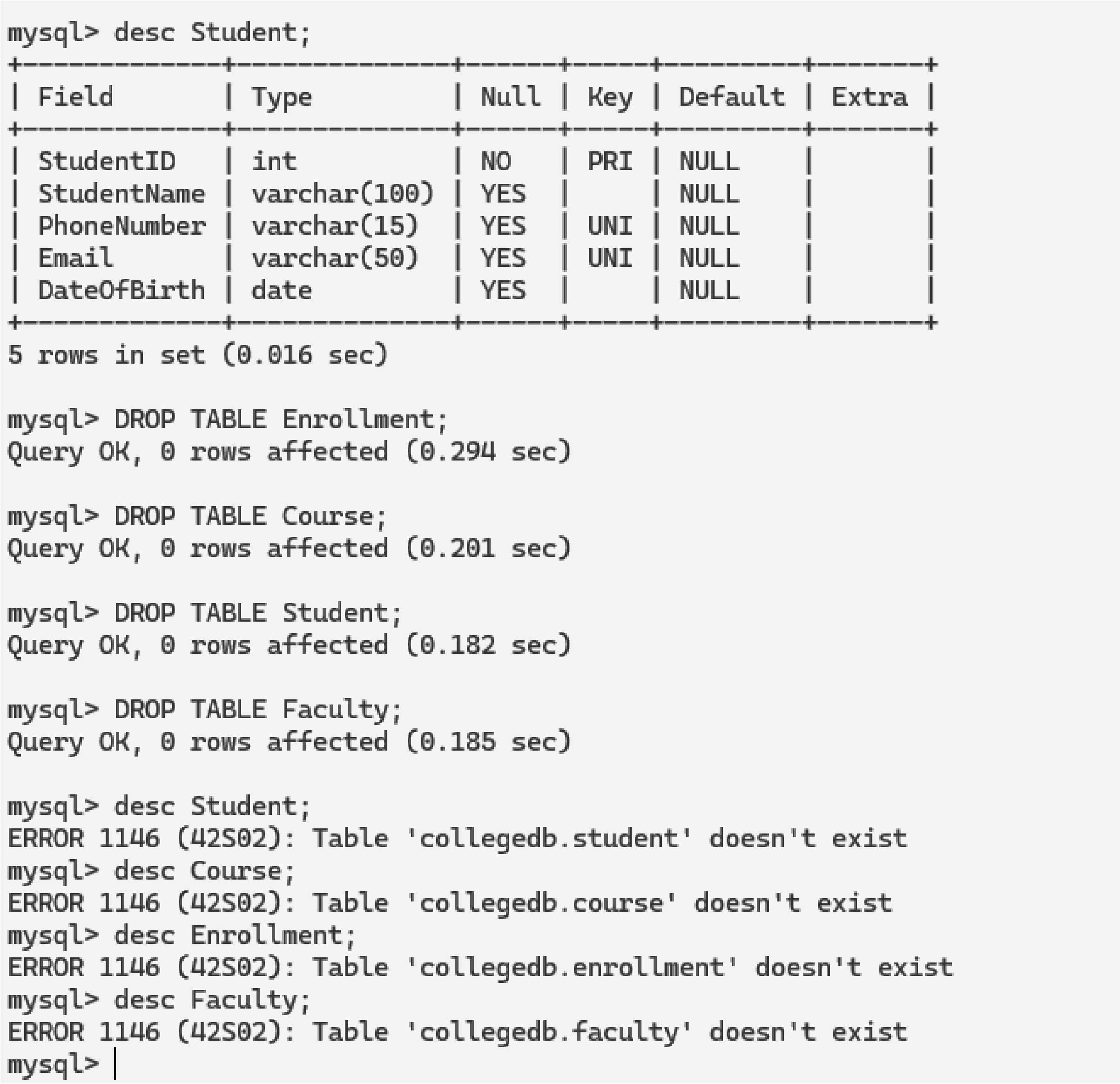
PRACTICAL NO:05



```
mysql> ALTER TABLE Student
    -> ADD DateOfBirth DATE;
Query OK, 0 rows affected (0.859 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> DESC Student
    -> ;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| StudentID   | int         | NO   | PRI | NULL    |       |
| StudentName | varchar(50) | NO   |     | NULL    |       |
| PhoneNumber | varchar(15) | YES  | UNI | NULL    |       |
| Email       | varchar(50) | YES  |     | NULL    |       |
| DateOfBirth | date        | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
5 rows in set (0.019 sec)

mysql> ALTER TABLE Student
    -> ADD CONSTRAINT uq_email UNIQUE (Email);
Query OK, 0 rows affected (0.223 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc Student;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| StudentID   | int         | NO   | PRI | NULL    |       |
| StudentName | varchar(50) | NO   |     | NULL    |       |
| PhoneNumber | varchar(15) | YES  | UNI | NULL    |       |
| Email       | varchar(50) | YES  | UNI | NULL    |       |
| DateOfBirth | date        | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
5 rows in set (0.014 sec)
```

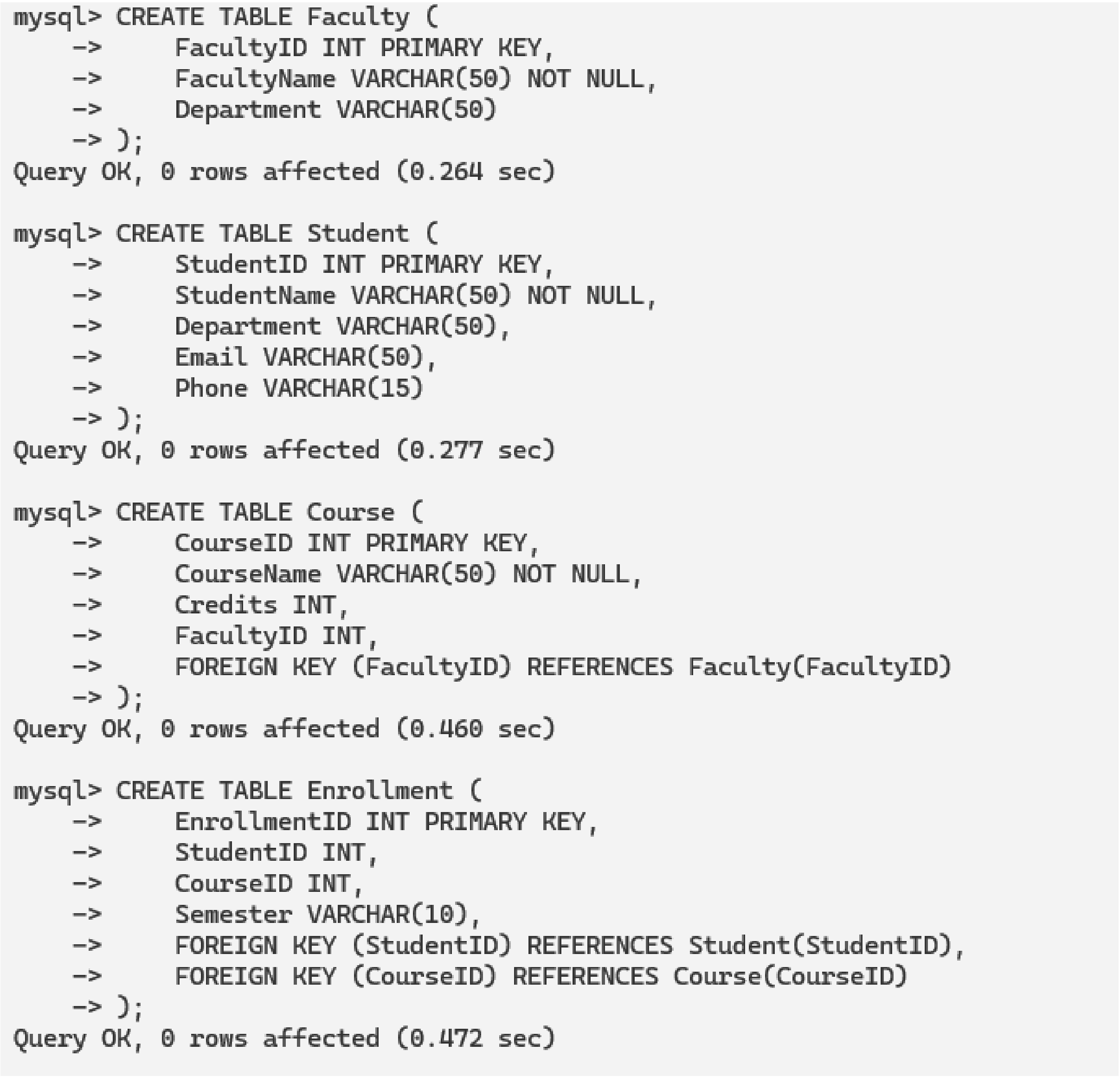


```
mysql> ALTER TABLE Student
    -> MODIFY StudentName VARCHAR(100);
Query OK, 0 rows affected (0.889 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc Student;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| StudentID   | int          | NO   | PRI | NULL    |       |
| StudentName | varchar(100) | YES  |     | NULL    |       |
| PhoneNumber | varchar(15)  | YES  | UNI | NULL    |       |
| Email       | varchar(50)  | YES  | UNI | NULL    |       |
| DateOfBirth | date         | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
5 rows in set (0.012 sec)

mysql> ALTER TABLE Course
    -> MODIFY Credits INT NOT NULL;
Query OK, 0 rows affected (0.815 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc Student;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| StudentID   | int          | NO   | PRI | NULL    |       |
| StudentName | varchar(100) | YES  |     | NULL    |       |
| PhoneNumber | varchar(15)  | YES  | UNI | NULL    |       |
| Email       | varchar(50)  | YES  | UNI | NULL    |       |
| DateOfBirth | date         | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
5 rows in set (0.016 sec)
```

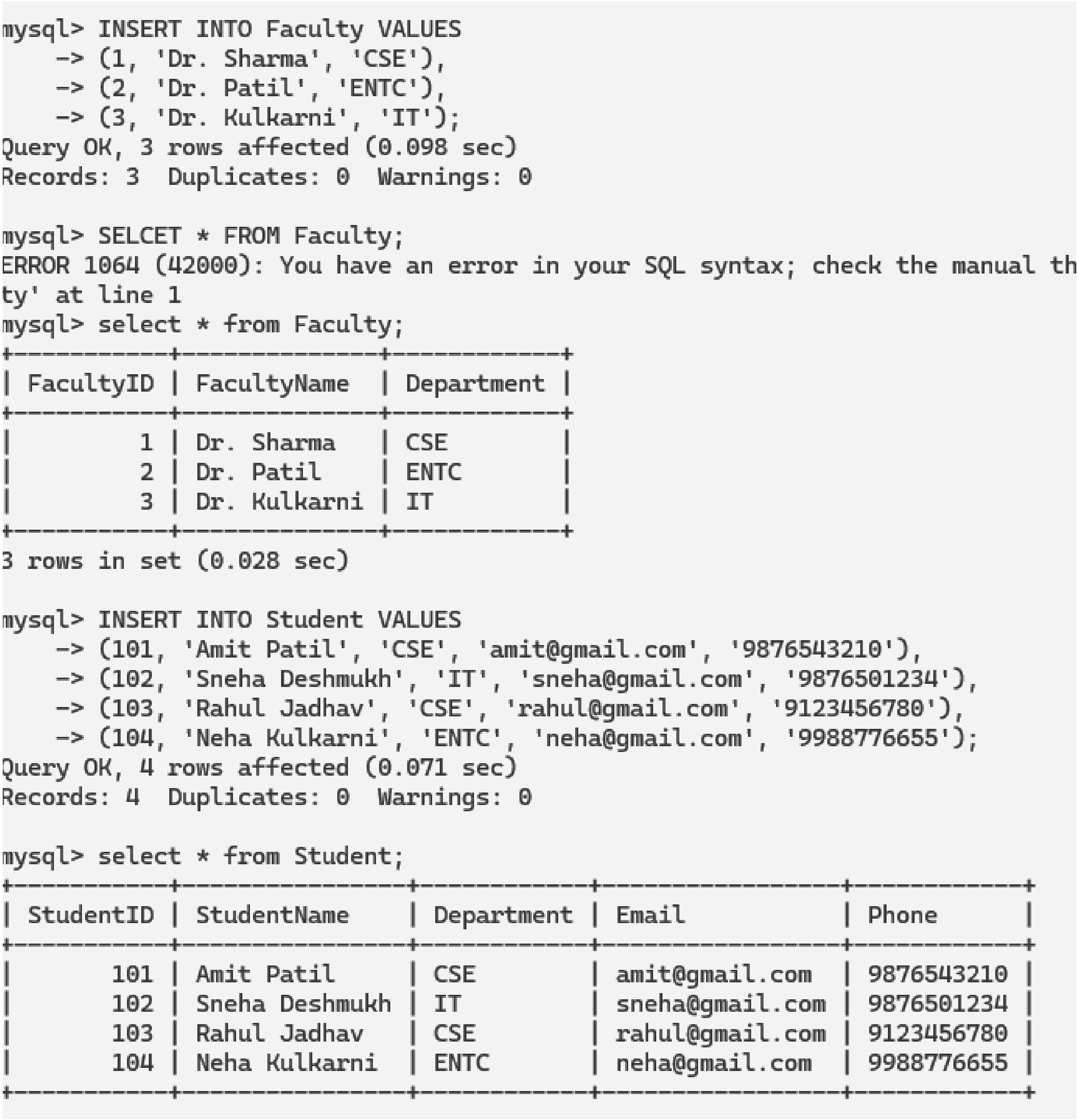


```
mysql> desc Student;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| StudentID   | int          | NO   | PRI | NULL    |       |
| StudentName | varchar(100) | YES  |     | NULL    |       |
| PhoneNumber | varchar(15)  | YES  | UNI | NULL    |       |
| Email       | varchar(50)  | YES  | UNI | NULL    |       |
| DateOfBirth | date         | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
5 rows in set (0.016 sec)

mysql> DROP TABLE Enrollment;
Query OK, 0 rows affected (0.294 sec)

mysql> DROP TABLE Course;
Query OK, 0 rows affected (0.201 sec)

mysql> DROP TABLE Student;
Query OK, 0 rows affected (0.182 sec)

mysql> DROP TABLE Faculty;
Query OK, 0 rows affected (0.185 sec)

mysql> desc Student;
ERROR 1146 (42S02): Table 'collegedb.student' doesn't exist
mysql> desc Course;
ERROR 1146 (42S02): Table 'collegedb.course' doesn't exist
mysql> desc Enrollment;
ERROR 1146 (42S02): Table 'collegedb.enrollment' doesn't exist
mysql> desc Faculty;
ERROR 1146 (42S02): Table 'collegedb.faculty' doesn't exist
mysql> |
```

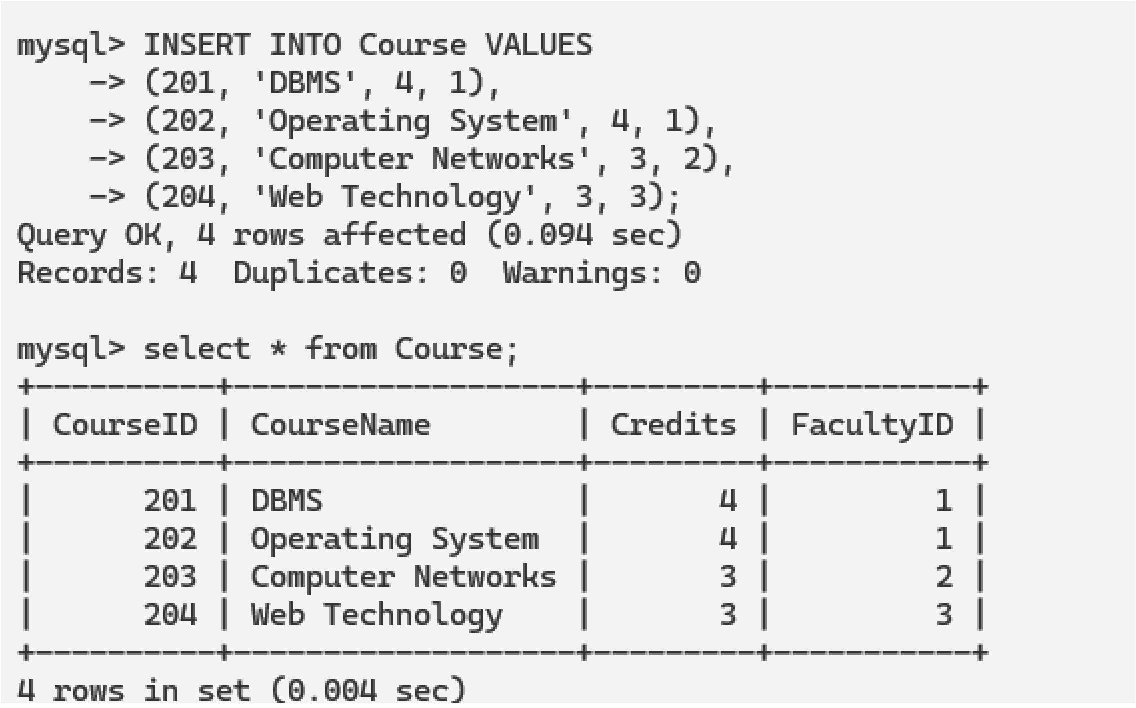
PRACTICAL NO:06



```
mysql> CREATE TABLE Faculty (
    ->     FacultyID INT PRIMARY KEY,
    ->     FacultyName VARCHAR(50) NOT NULL,
    ->     Department VARCHAR(50)
    -> );
Query OK, 0 rows affected (0.264 sec)

mysql> CREATE TABLE Student (
    ->     StudentID INT PRIMARY KEY,
    ->     StudentName VARCHAR(50) NOT NULL,
    ->     Department VARCHAR(50),
    ->     Email VARCHAR(50),
    ->     Phone VARCHAR(15)
    -> );
Query OK, 0 rows affected (0.277 sec)

mysql> CREATE TABLE Course (
    ->     CourseID INT PRIMARY KEY,
    ->     CourseName VARCHAR(50) NOT NULL,
    ->     Credits INT,
    ->     FacultyID INT,
    ->     FOREIGN KEY (FacultyID) REFERENCES Faculty(FacultyID)
    -> );
Query OK, 0 rows affected (0.460 sec)

mysql> CREATE TABLE Enrollment (
    ->     EnrollmentID INT PRIMARY KEY,
    ->     StudentID INT,
    ->     CourseID INT,
    ->     Semester VARCHAR(10),
    ->     FOREIGN KEY (StudentID) REFERENCES Student(StudentID),
    ->     FOREIGN KEY (CourseID) REFERENCES Course(CourseID)
    -> );
Query OK, 0 rows affected (0.472 sec)
```

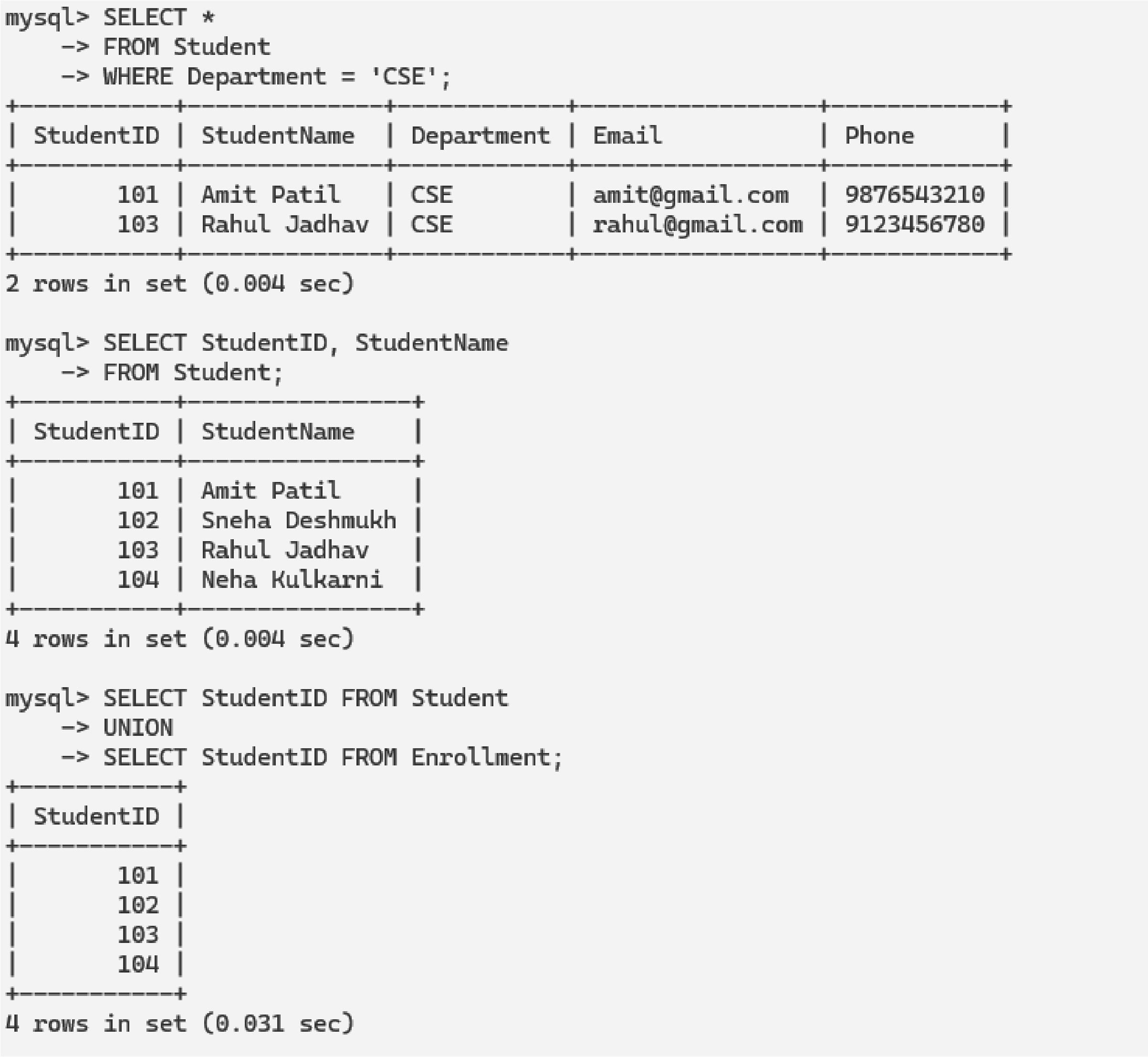


```
mysql> INSERT INTO Faculty VALUES
    -> (1, 'Dr. Sharma', 'CSE'),
    -> (2, 'Dr. Patil', 'ENTC'),
    -> (3, 'Dr. Kulkarni', 'IT');
Query OK, 3 rows affected (0.098 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> SELCET * FROM Faculty;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual th
ty' at line 1
mysql> select * from Faculty;
+-----------+--------------+------------+
| FacultyID | FacultyName  | Department |
+-----------+--------------+------------+
|         1 | Dr. Sharma   | CSE        |
|         2 | Dr. Patil    | ENTC       |
|         3 | Dr. Kulkarni | IT         |
+-----------+--------------+------------+
3 rows in set (0.028 sec)

mysql> INSERT INTO Student VALUES
    -> (101, 'Amit Patil', 'CSE', 'amit@gmail.com', '9876543210'),
    -> (102, 'Sneha Deshmukh', 'IT', 'sneha@gmail.com', '9876501234'),
    -> (103, 'Rahul Jadhav', 'CSE', 'rahul@gmail.com', '9123456780'),
    -> (104, 'Neha Kulkarni', 'ENTC', 'neha@gmail.com', '9988776655');
Query OK, 4 rows affected (0.071 sec)
Records: 4  Duplicates: 0  Warnings: 0

mysql> select * from Student;
+-----------+----------------+------------+-----------------+------------+
| StudentID | StudentName    | Department | Email           | Phone      |
+-----------+----------------+------------+-----------------+------------+
|       101 | Amit Patil     | CSE        | amit@gmail.com  | 9876543210 |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com | 9876501234 |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com | 9123456780 |
|       104 | Neha Kulkarni  | ENTC       | neha@gmail.com  | 9988776655 |
+-----------+----------------+------------+-----------------+------------+
```



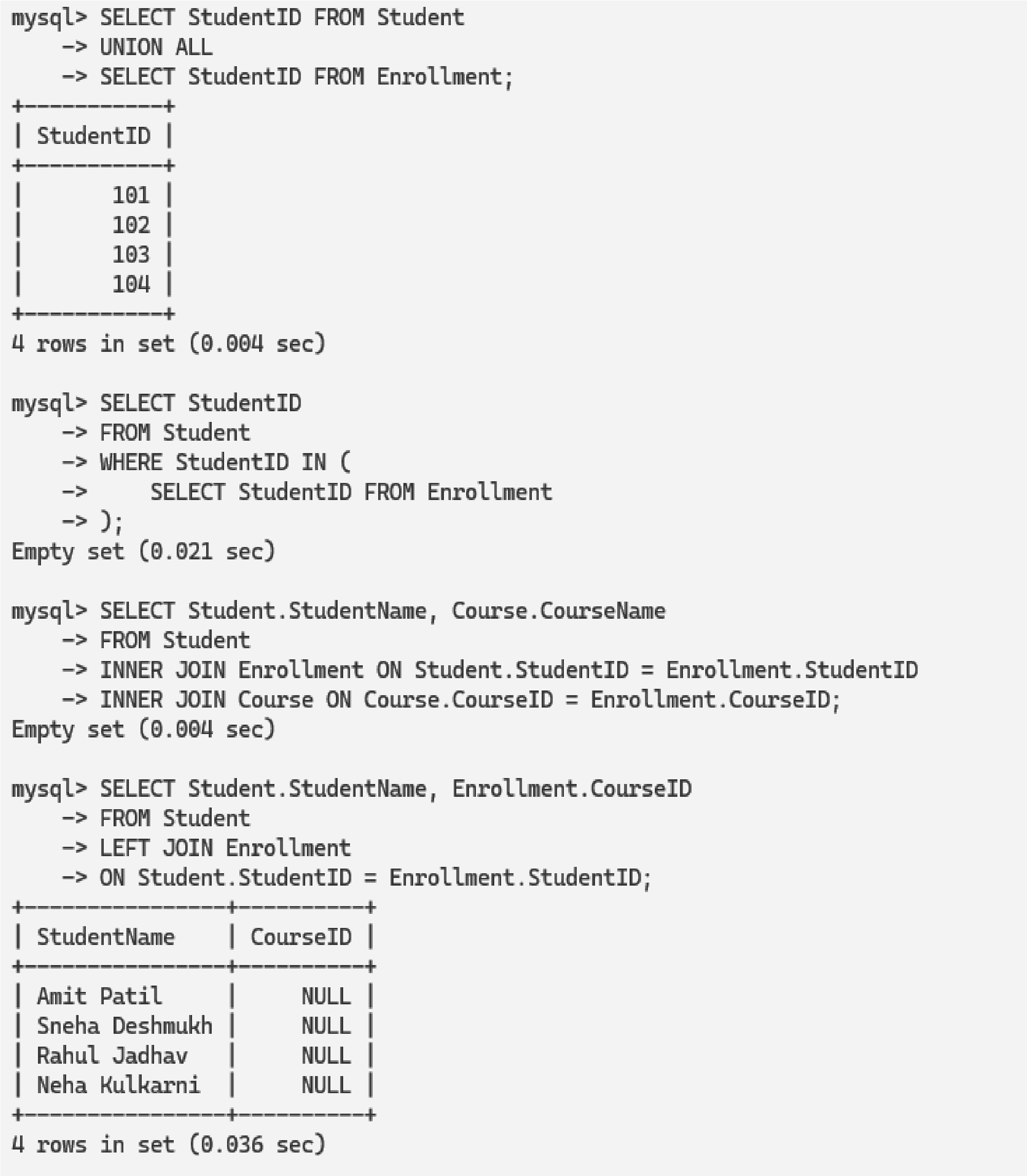
```
mysql> INSERT INTO Course VALUES
    -> (201, 'DBMS', 4, 1),
    -> (202, 'Operating System', 4, 1),
    -> (203, 'Computer Networks', 3, 2),
    -> (204, 'Web Technology', 3, 3);
Query OK, 4 rows affected (0.094 sec)
Records: 4  Duplicates: 0  Warnings: 0

mysql> select * from Course;
+----------+-------------------+---------+-----------+
| CourseID | CourseName        | Credits | FacultyID |
+----------+-------------------+---------+-----------+
|      201 | DBMS              |       4 |         1 |
|      202 | Operating System  |       4 |         1 |
|      203 | Computer Networks |       3 |         2 |
|      204 | Web Technology    |       3 |         3 |
+----------+-------------------+---------+-----------+
4 rows in set (0.004 sec)
```

1) **Relational Operator**	**SQL Used**
Selection (σ)	WHERE
Projection (π)	SELECT columns
Union (∪)	UNION
Intersection (∩)	IN
Difference (−)	NOT IN
Cartesian (×)	FROM T1, T2
Join (⋈)	INNER JOIN
Outer Join	LEFT / RIGHT
Rename (ρ)	AS
Division (÷)	GROUP BY + HAVING

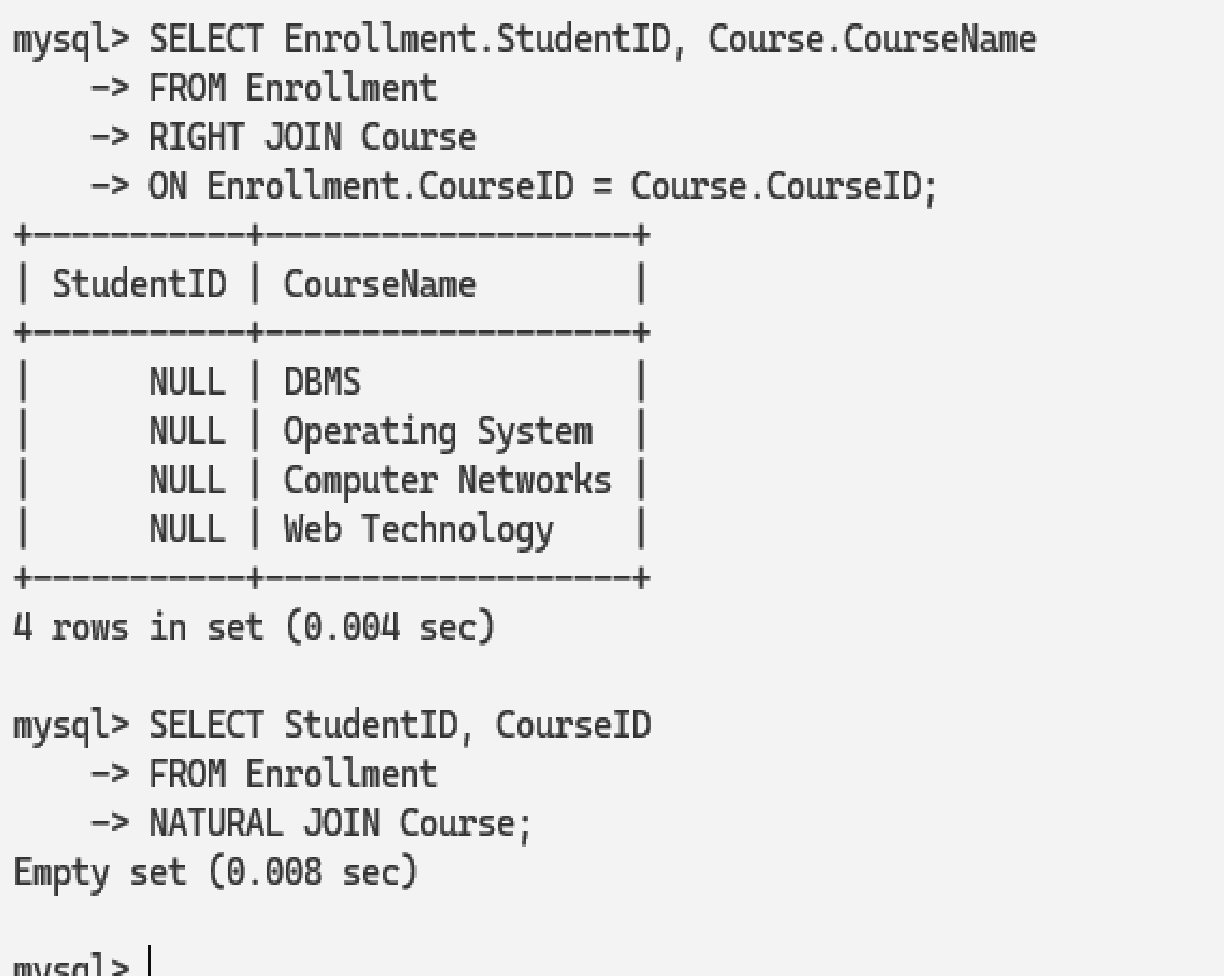


```
mysql> SELECT *
    -> FROM Student
    -> WHERE Department = 'CSE';
+-----------+-------------+------------+-----------------+------------+
| StudentID | StudentName | Department | Email           | Phone      |
+-----------+-------------+------------+-----------------+------------+
|       101 | Amit Patil  | CSE        | amit@gmail.com  | 9876543210 |
|       103 | Rahul Jadhav | CSE       | rahul@gmail.com | 9123456780 |
+-----------+-------------+------------+-----------------+------------+
2 rows in set (0.004 sec)

mysql> SELECT StudentID, StudentName
    -> FROM Student;
+-----------+---------------+
| StudentID | StudentName   |
+-----------+---------------+
|       101 | Amit Patil    |
|       102 | Sneha Deshmukh |
|       103 | Rahul Jadhav  |
|       104 | Neha Kulkarni |
+-----------+---------------+
4 rows in set (0.004 sec)

mysql> SELECT StudentID FROM Student
    -> UNION
    -> SELECT StudentID FROM Enrollment;
+-----------+
| StudentID |
+-----------+
|       101 |
|       102 |
|       103 |
|       104 |
+-----------+
4 rows in set (0.031 sec)
```

Operator	**Usage**
LIKE	Pattern search
%	Any number of characters
_	Single character

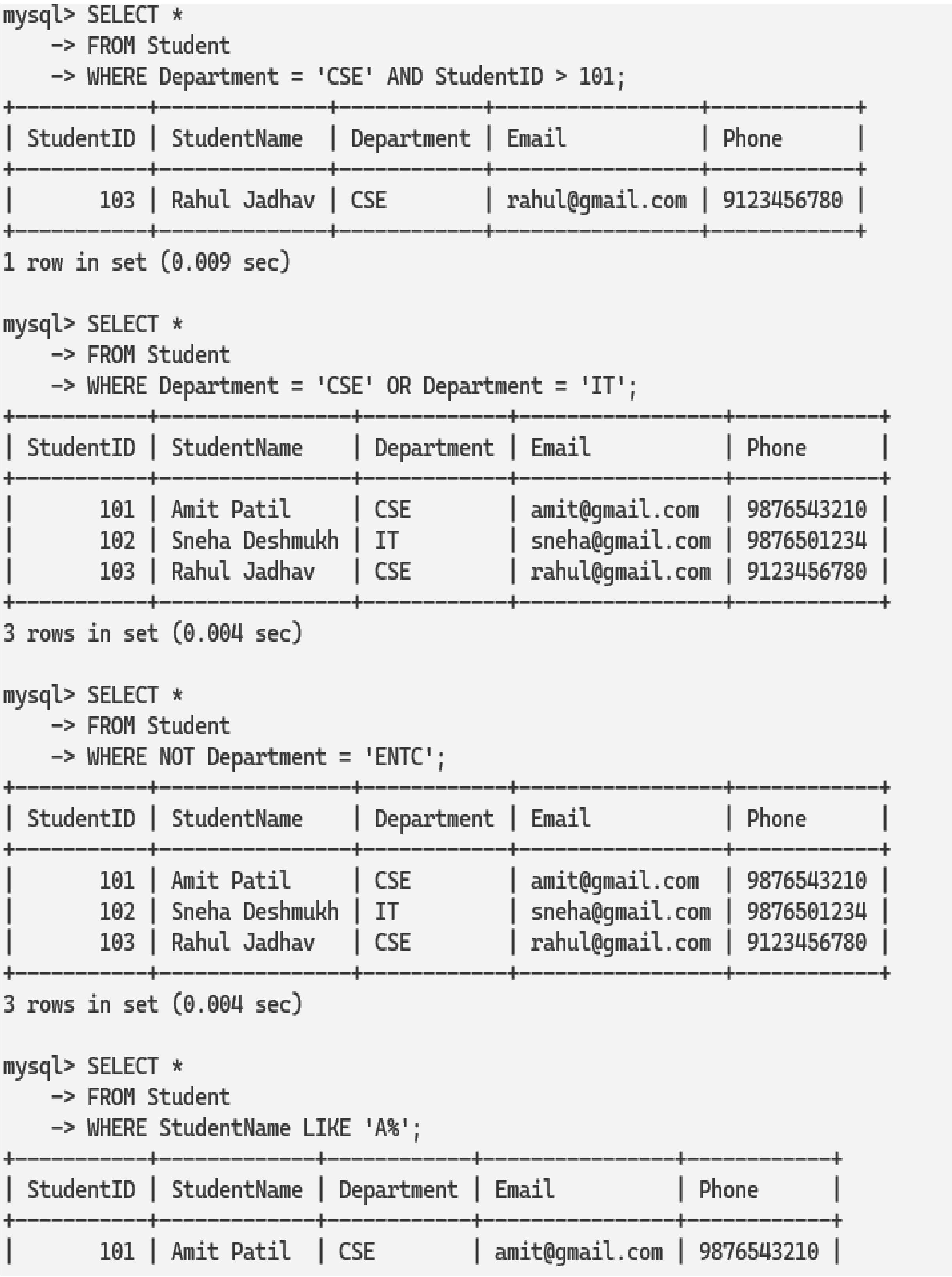


```
mysql> SELECT StudentID FROM Student
    -> UNION ALL
    -> SELECT StudentID FROM Enrollment;
+-----------+
| StudentID |
+-----------+
|       101 |
|       102 |
|       103 |
|       104 |
+-----------+
4 rows in set (0.004 sec)

mysql> SELECT StudentID
    -> FROM Student
    -> WHERE StudentID IN (
    ->     SELECT StudentID FROM Enrollment
    -> );
Empty set (0.021 sec)

mysql> SELECT Student.StudentName, Course.CourseName
    -> FROM Student
    -> INNER JOIN Enrollment ON Student.StudentID = Enrollment.StudentID
    -> INNER JOIN Course ON Course.CourseID = Enrollment.CourseID;
Empty set (0.004 sec)

mysql> SELECT Student.StudentName, Enrollment.CourseID
    -> FROM Student
    -> LEFT JOIN Enrollment
    -> ON Student.StudentID = Enrollment.StudentID;
+----------------+----------+
| StudentName    | CourseID |
+----------------+----------+
| Amit Patil     |     NULL |
| Sneha Deshmukh |     NULL |
| Rahul Jadhav   |     NULL |
| Neha Kulkarni  |     NULL |
+----------------+----------+
4 rows in set (0.036 sec)
```

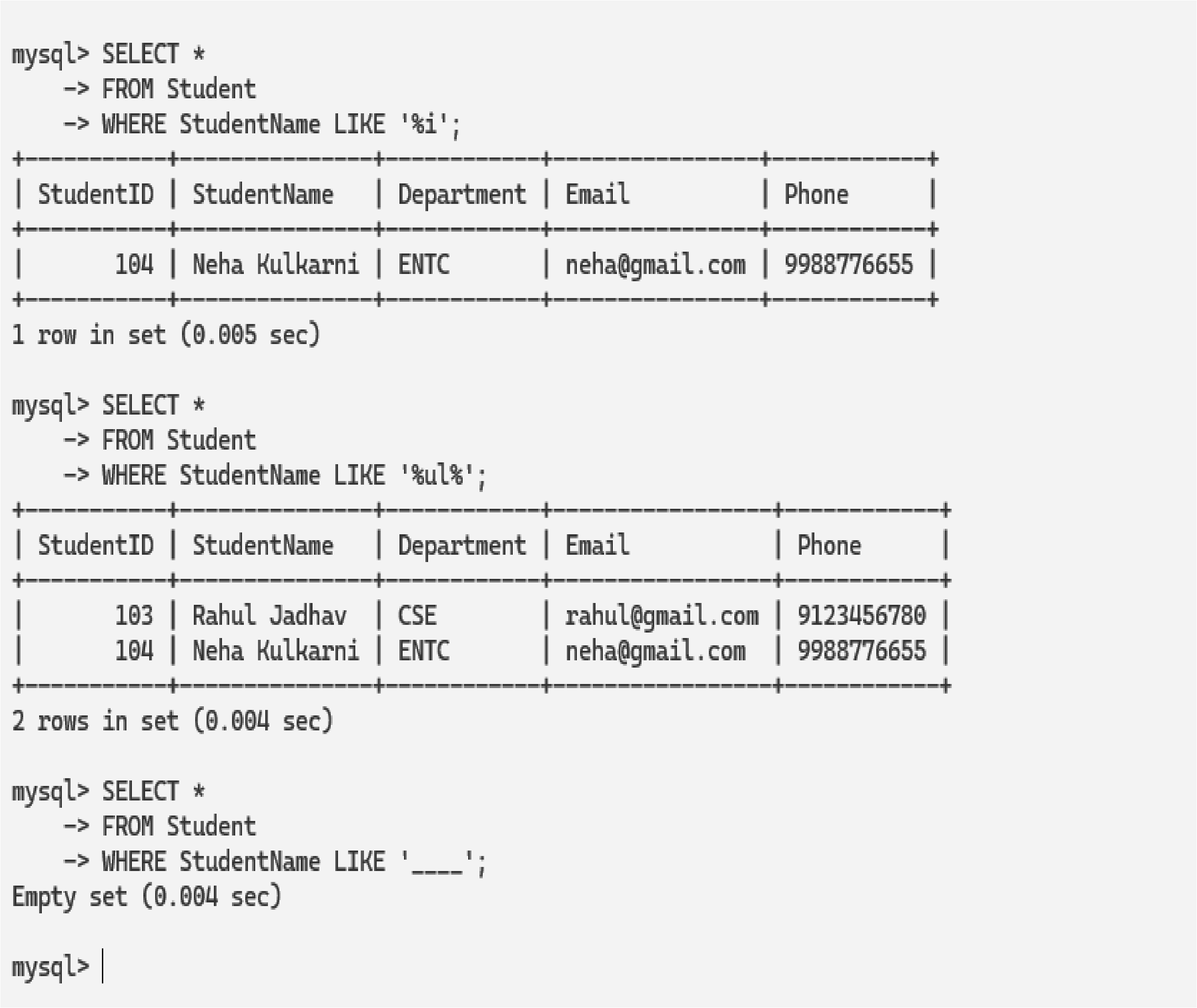


```
mysql> SELECT Enrollment.StudentID, Course.CourseName
    -> FROM Enrollment
    -> RIGHT JOIN Course
    -> ON Enrollment.CourseID = Course.CourseID;
+-----------+-------------------+
| StudentID | CourseName        |
+-----------+-------------------+
|      NULL | DBMS              |
|      NULL | Operating System  |
|      NULL | Computer Networks |
|      NULL | Web Technology    |
+-----------+-------------------+
4 rows in set (0.004 sec)

mysql> SELECT StudentID, CourseID
    -> FROM Enrollment
    -> NATURAL JOIN Course;
Empty set (0.008 sec)

mysql> |
```

2)Operator	Description
AND	All conditions true
OR	Any condition true
NOT	Negates condition



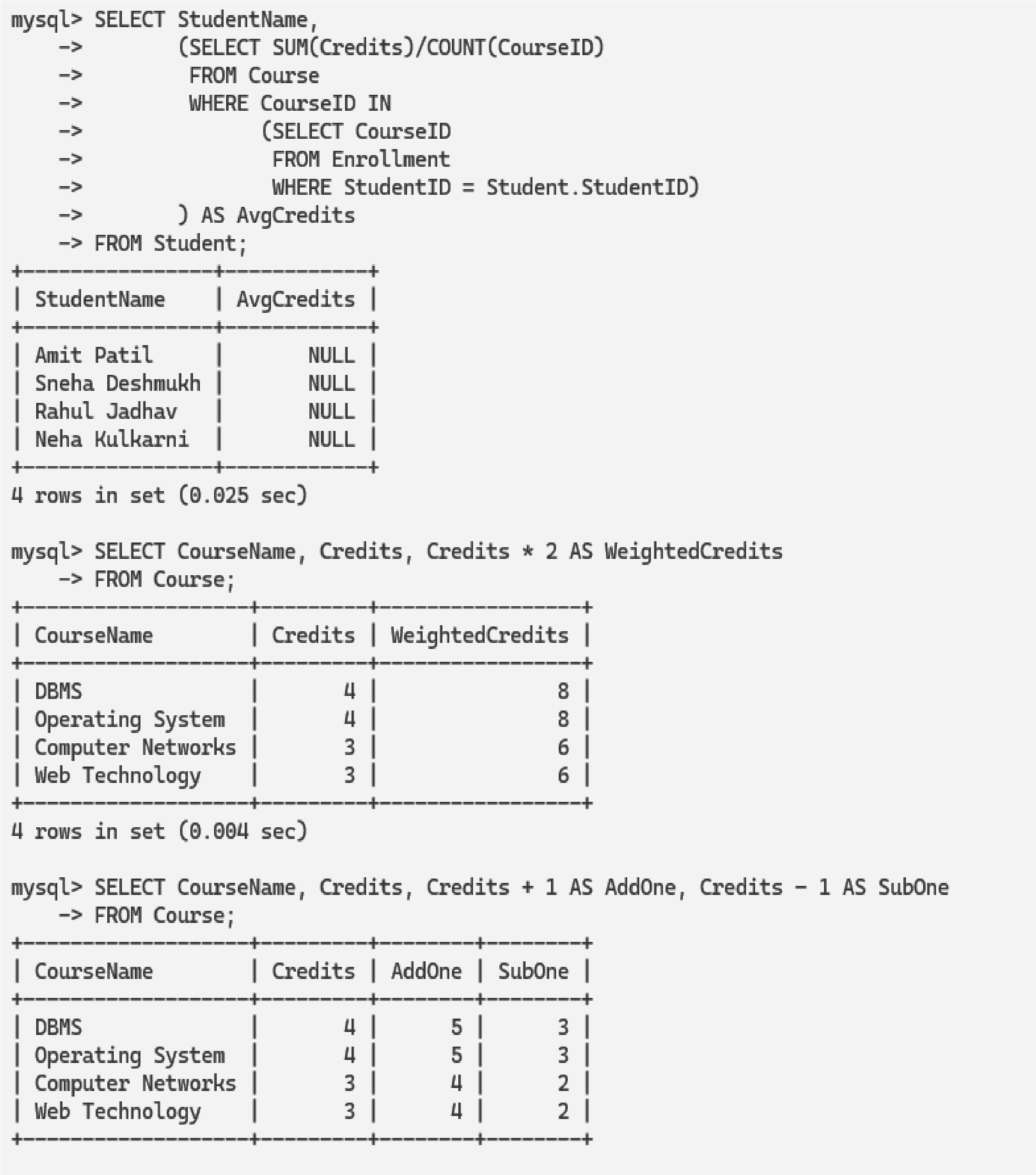
```
mysql> SELECT *
    -> FROM Student
    -> WHERE Department = 'CSE' AND StudentID > 101;
+-----------+--------------+------------+-----------------+------------+
| StudentID | StudentName  | Department | Email           | Phone      |
+-----------+--------------+------------+-----------------+------------+
|       103 | Rahul Jadhav | CSE        | rahul@gmail.com | 9123456780 |
+-----------+--------------+------------+-----------------+------------+
1 row in set (0.009 sec)

mysql> SELECT *
    -> FROM Student
    -> WHERE Department = 'CSE' OR Department = 'IT';
+-----------+----------------+------------+-----------------+------------+
| StudentID | StudentName    | Department | Email           | Phone      |
+-----------+----------------+------------+-----------------+------------+
|       101 | Amit Patil     | CSE        | amit@gmail.com  | 9876543210 |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com | 9876501234 |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com | 9123456780 |
+-----------+----------------+------------+-----------------+------------+
3 rows in set (0.004 sec)

mysql> SELECT *
    -> FROM Student
    -> WHERE NOT Department = 'ENTC';
+-----------+----------------+------------+-----------------+------------+
| StudentID | StudentName    | Department | Email           | Phone      |
+-----------+----------------+------------+-----------------+------------+
|       101 | Amit Patil     | CSE        | amit@gmail.com  | 9876543210 |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com | 9876501234 |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com | 9123456780 |
+-----------+----------------+------------+-----------------+------------+
3 rows in set (0.004 sec)

mysql> SELECT *
    -> FROM Student
    -> WHERE StudentName LIKE 'A%';
+-----------+-------------+------------+----------------+------------+
| StudentID | StudentName | Department | Email          | Phone      |
+-----------+-------------+------------+----------------+------------+
|       101 | Amit Patil  | CSE        | amit@gmail.com | 9876543210 |
```



```
mysql> SELECT *
    -> FROM Student
    -> WHERE StudentName LIKE '%i';
+-----------+--------------+------------+----------------+------------+
| StudentID | StudentName  | Department | Email          | Phone      |
+-----------+--------------+------------+----------------+------------+
|       104 | Neha Kulkarni | ENTC      | neha@gmail.com | 9988776655 |
+-----------+--------------+------------+----------------+------------+
1 row in set (0.005 sec)

mysql> SELECT *
    -> FROM Student
    -> WHERE StudentName LIKE '%ul%';
+-----------+--------------+------------+-----------------+------------+
| StudentID | StudentName  | Department | Email           | Phone      |
+-----------+--------------+------------+-----------------+------------+
|       103 | Rahul Jadhav  | CSE       | rahul@gmail.com | 9123456780 |
|       104 | Neha Kulkarni | ENTC      | neha@gmail.com  | 9988776655 |
+-----------+--------------+------------+-----------------+------------+
2 rows in set (0.004 sec)

mysql> SELECT *
    -> FROM Student
    -> WHERE StudentName LIKE '____';
Empty set (0.004 sec)

mysql>
```

3) ARITHMETIC OPERATIONS IN SQL

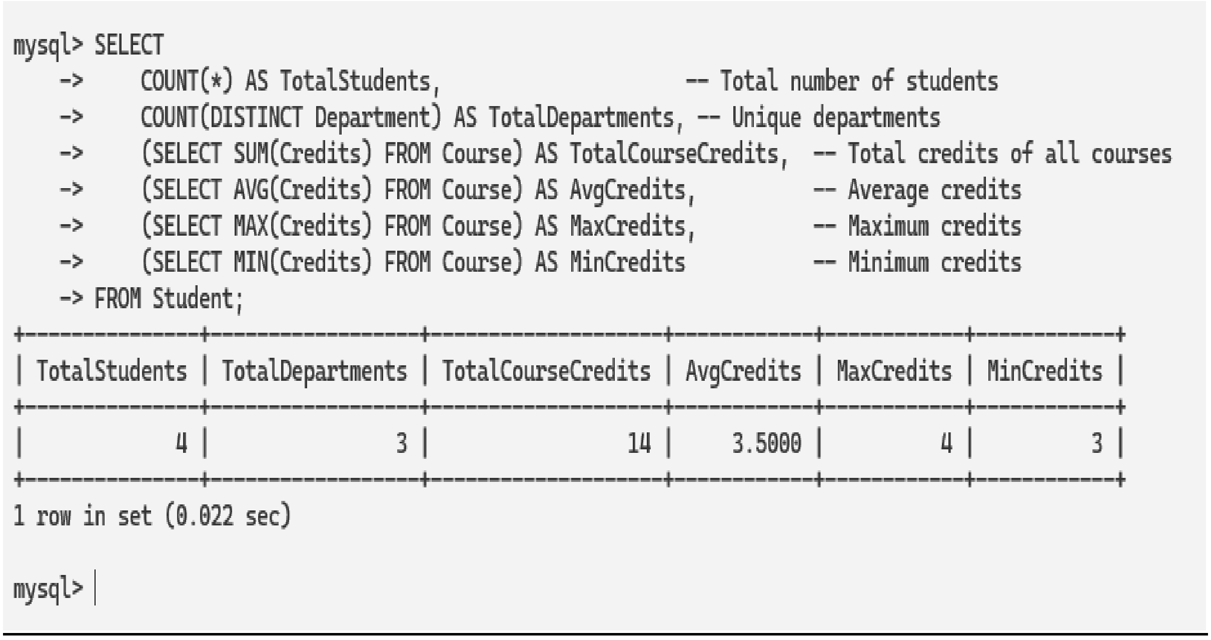
Operator	**Meaning**	**Example**
+	Addition	Credits + 1
-	Subtraction	Credits - 1
*	Multiplication	Credits * 2
/	Division	SUM(Credits)/COUNT(CourseID)
%	Modulus	SUM(Credits) % 2



```
mysql> SELECT StudentName,
    ->        (SELECT SUM(Credits)/COUNT(CourseID)
    ->         FROM Course
    ->         WHERE CourseID IN
    ->               (SELECT CourseID
    ->                FROM Enrollment
    ->                WHERE StudentID = Student.StudentID)
    ->        ) AS AvgCredits
    -> FROM Student;
+----------------+------------+
| StudentName    | AvgCredits |
+----------------+------------+
| Amit Patil     |       NULL |
| Sneha Deshmukh |       NULL |
| Rahul Jadhav   |       NULL |
| Neha Kulkarni  |       NULL |
+----------------+------------+
4 rows in set (0.025 sec)

mysql> SELECT CourseName, Credits, Credits * 2 AS WeightedCredits
    -> FROM Course;
+-------------------+---------+-----------------+
| CourseName        | Credits | WeightedCredits |
+-------------------+---------+-----------------+
| DBMS              |       4 |               8 |
| Operating System  |       4 |               8 |
| Computer Networks |       3 |               6 |
| Web Technology    |       3 |               6 |
+-------------------+---------+-----------------+
4 rows in set (0.004 sec)

mysql> SELECT CourseName, Credits, Credits + 1 AS AddOne, Credits - 1 AS SubOne
    -> FROM Course;
+-------------------+---------+--------+--------+
| CourseName        | Credits | AddOne | SubOne |
+-------------------+---------+--------+--------+
| DBMS              |       4 |      5 |      3 |
| Operating System  |       4 |      5 |      3 |
| Computer Networks |       3 |      4 |      2 |
| Web Technology    |       3 |      4 |      2 |
+-------------------+---------+--------+--------+
```

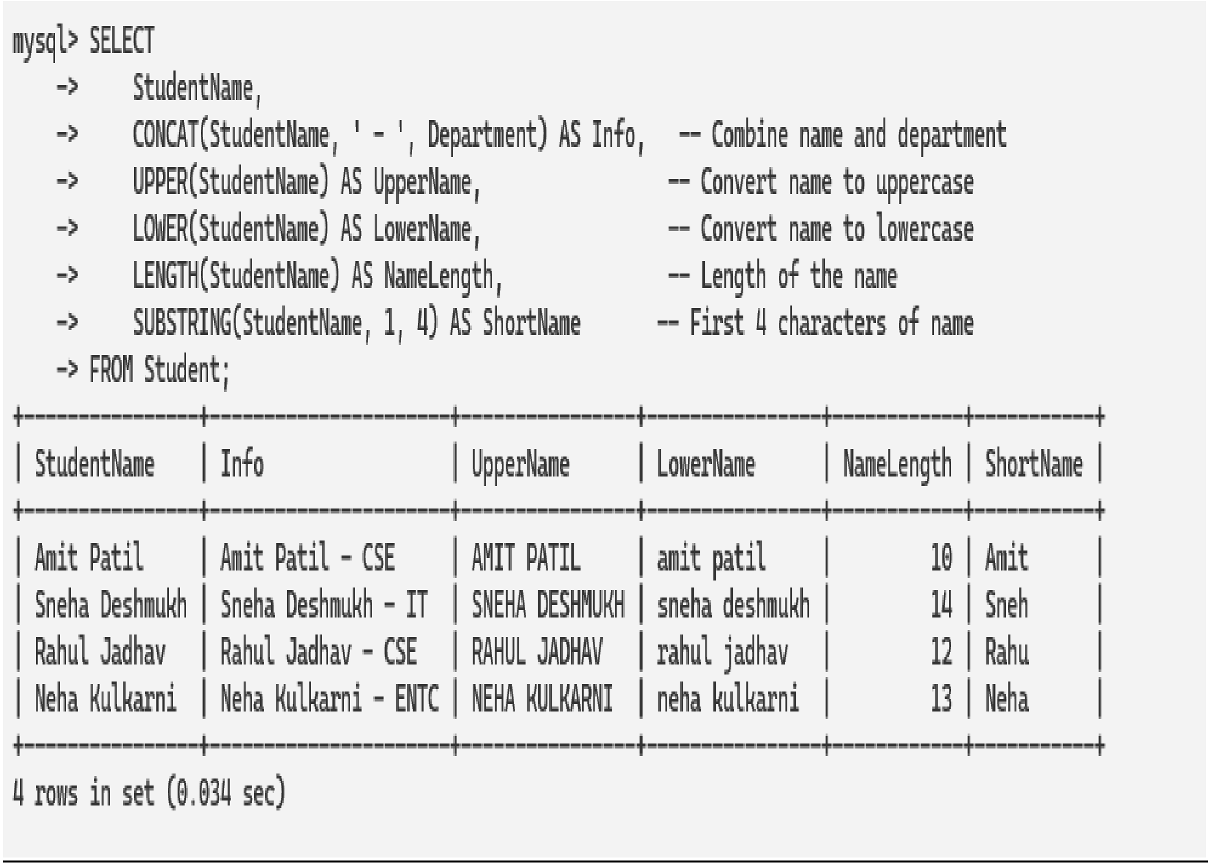
4)Function Type	**Examples**	**Usage**
Aggregate	COUNT, SUM, AVG, MAX, MIN	Summary values
String	CONCAT, UPPER, LOWER, LENGTH, SUBSTRING	Manipulate text
Numeric	ROUND, CEIL, FLOOR, MOD	Numeric calculations
Date	CURDATE, YEAR, DATEDIFF	Date operations

AGGREGATE FUNCTION



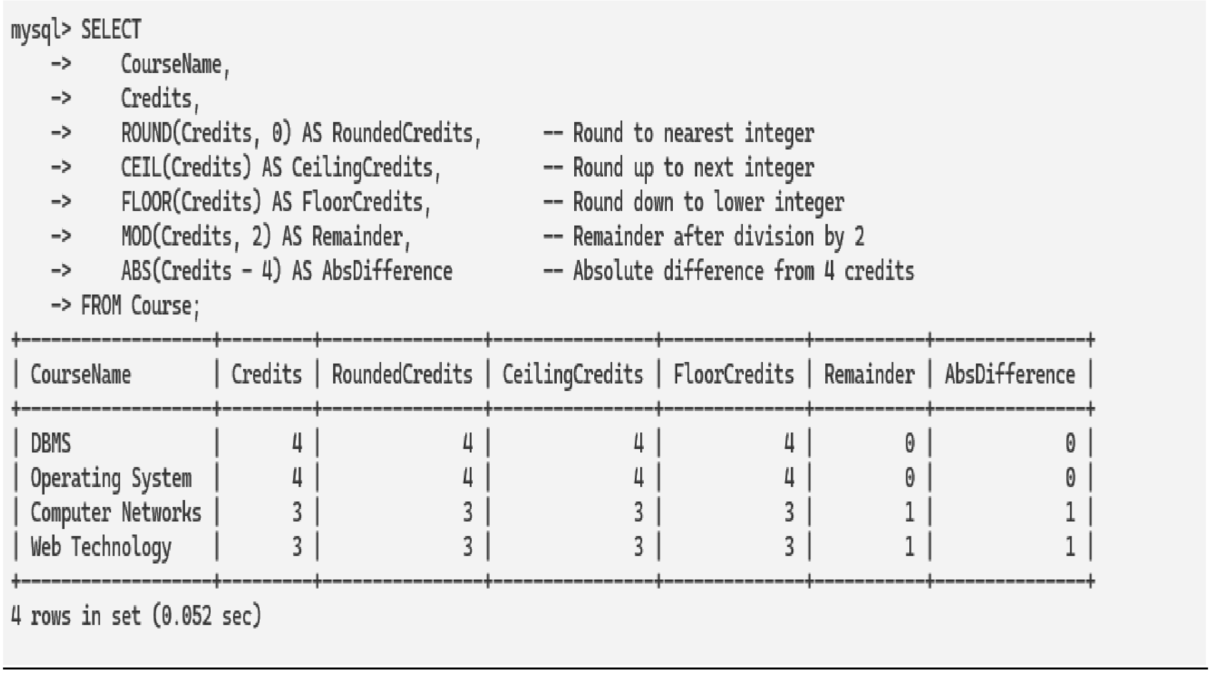
```
mysql> SELECT
    ->     COUNT(*) AS TotalStudents,                    -- Total number of students
    ->     COUNT(DISTINCT Department) AS TotalDepartments, -- Unique departments
    ->     (SELECT SUM(Credits) FROM Course) AS TotalCourseCredits,  -- Total credits of all courses
    ->     (SELECT AVG(Credits) FROM Course) AS AvgCredits,          -- Average credits
    ->     (SELECT MAX(Credits) FROM Course) AS MaxCredits,          -- Maximum credits
    ->     (SELECT MIN(Credits) FROM Course) AS MinCredits           -- Minimum credits
    -> FROM Student;
+---------------+------------------+--------------------+------------+------------+------------+
| TotalStudents | TotalDepartments | TotalCourseCredits | AvgCredits | MaxCredits | MinCredits |
+---------------+------------------+--------------------+------------+------------+------------+
|             4 |                3 |                 14 |     3.5000 |          4 |          3 |
+---------------+------------------+--------------------+------------+------------+------------+
1 row in set (0.022 sec)

mysql> |
```

STRING FUNCTION



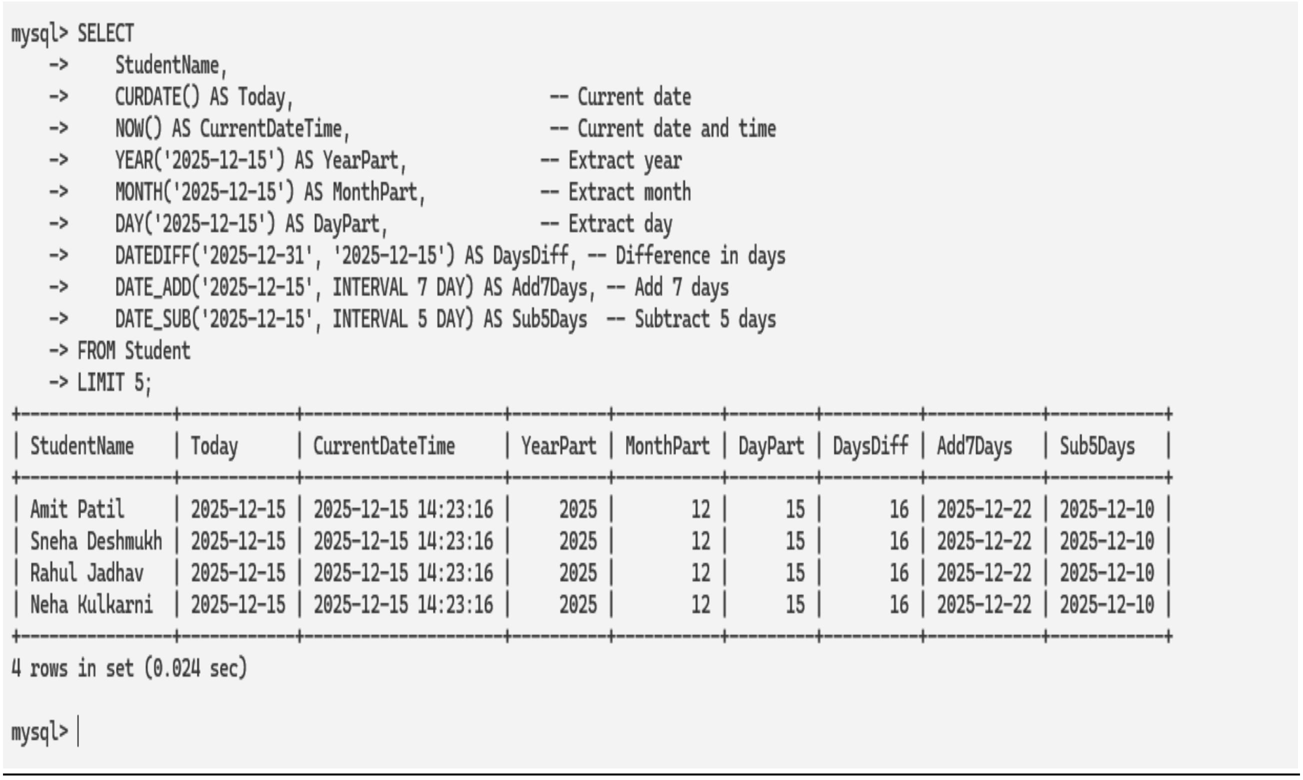
```
mysql> SELECT
    ->     StudentName,
    ->     CONCAT(StudentName, ' - ', Department) AS Info,   -- Combine name and department
    ->     UPPER(StudentName) AS UpperName,                 -- Convert name to uppercase
    ->     LOWER(StudentName) AS LowerName,                 -- Convert name to lowercase
    ->     LENGTH(StudentName) AS NameLength,               -- Length of the name
    ->     SUBSTRING(StudentName, 1, 4) AS ShortName       -- First 4 characters of name
    -> FROM Student;
+----------------+---------------------+----------------+----------------+------------+-----------+
| StudentName    | Info                | UpperName      | LowerName      | NameLength | ShortName |
+----------------+---------------------+----------------+----------------+------------+-----------+
| Amit Patil     | Amit Patil - CSE    | AMIT PATIL     | amit patil     |         10 | Amit      |
| Sneha Deshmukh | Sneha Deshmukh - IT | SNEHA DESHMUKH | sneha deshmukh |         14 | Sneh      |
| Rahul Jadhav   | Rahul Jadhav - CSE  | RAHUL JADHAV   | rahul jadhav   |         12 | Rahu      |
| Neha Kulkarni  | Neha Kulkarni - ENTC| NEHA KULKARNI  | neha kulkarni  |         13 | Neha      |
+----------------+---------------------+----------------+----------------+------------+-----------+
4 rows in set (0.034 sec)
```

NUMERIC FUNCTION



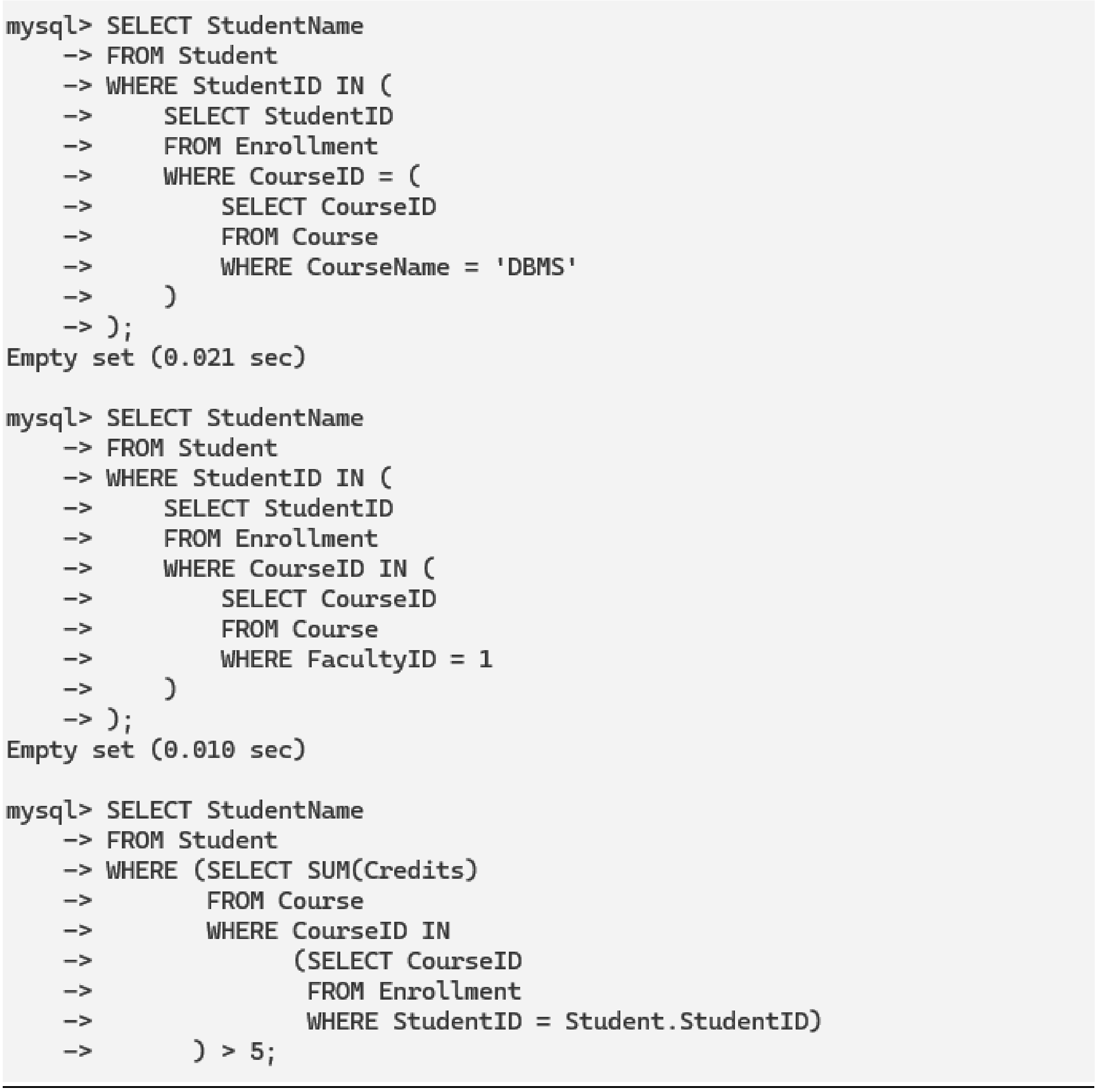
```
mysql> SELECT
    ->     CourseName,
    ->     Credits,
    ->     ROUND(Credits, 0) AS RoundedCredits,      -- Round to nearest integer
    ->     CEIL(Credits) AS CeilingCredits,          -- Round up to next integer
    ->     FLOOR(Credits) AS FloorCredits,           -- Round down to lower integer
    ->     MOD(Credits, 2) AS Remainder,             -- Remainder after division by 2
    ->     ABS(Credits - 4) AS AbsDifference         -- Absolute difference from 4 credits
    -> FROM Course;
+-------------------+---------+----------------+----------------+--------------+-----------+---------------+
| CourseName        | Credits | RoundedCredits | CeilingCredits | FloorCredits | Remainder | AbsDifference |
+-------------------+---------+----------------+----------------+--------------+-----------+---------------+
| DBMS              |       4 |              4 |              4 |            4 |         0 |             0 |
| Operating System  |       4 |              4 |              4 |            4 |         0 |             0 |
| Computer Networks |       3 |              3 |              3 |            3 |         1 |             1 |
| Web Technology    |       3 |              3 |              3 |            3 |         1 |             1 |
+-------------------+---------+----------------+----------------+--------------+-----------+---------------+
4 rows in set (0.052 sec)
```

DATE FUNCTION



```
mysql> SELECT
    ->     StudentName,
    ->     CURDATE() AS Today,                            -- Current date
    ->     NOW() AS CurrentDateTime,                      -- Current date and time
    ->     YEAR('2025-12-15') AS YearPart,               -- Extract year
    ->     MONTH('2025-12-15') AS MonthPart,             -- Extract month
    ->     DAY('2025-12-15') AS DayPart,                 -- Extract day
    ->     DATEDIFF('2025-12-31', '2025-12-15') AS DaysDiff, -- Difference in days
    ->     DATE_ADD('2025-12-15', INTERVAL 7 DAY) AS Add7Days, -- Add 7 days
    ->     DATE_SUB('2025-12-15', INTERVAL 5 DAY) AS Sub5Days  -- Subtract 5 days
    -> FROM Student
    -> LIMIT 5;
+----------------+------------+---------------------+----------+-----------+---------+----------+------------+------------+
| StudentName    | Today      | CurrentDateTime     | YearPart | MonthPart | DayPart | DaysDiff | Add7Days   | Sub5Days   |
+----------------+------------+---------------------+----------+-----------+---------+----------+------------+------------+
| Amit Patil     | 2025-12-15 | 2025-12-15 14:23:16 |     2025 |        12 |      15 |       16 | 2025-12-22 | 2025-12-10 |
| Sneha Deshmukh | 2025-12-15 | 2025-12-15 14:23:16 |     2025 |        12 |      15 |       16 | 2025-12-22 | 2025-12-10 |
| Rahul Jadhav   | 2025-12-15 | 2025-12-15 14:23:16 |     2025 |        12 |      15 |       16 | 2025-12-22 | 2025-12-10 |
| Neha Kulkarni  | 2025-12-15 | 2025-12-15 14:23:16 |     2025 |        12 |      15 |       16 | 2025-12-22 | 2025-12-10 |
+----------------+------------+---------------------+----------+-----------+---------+----------+------------+------------+
4 rows in set (0.024 sec)

mysql> |
```

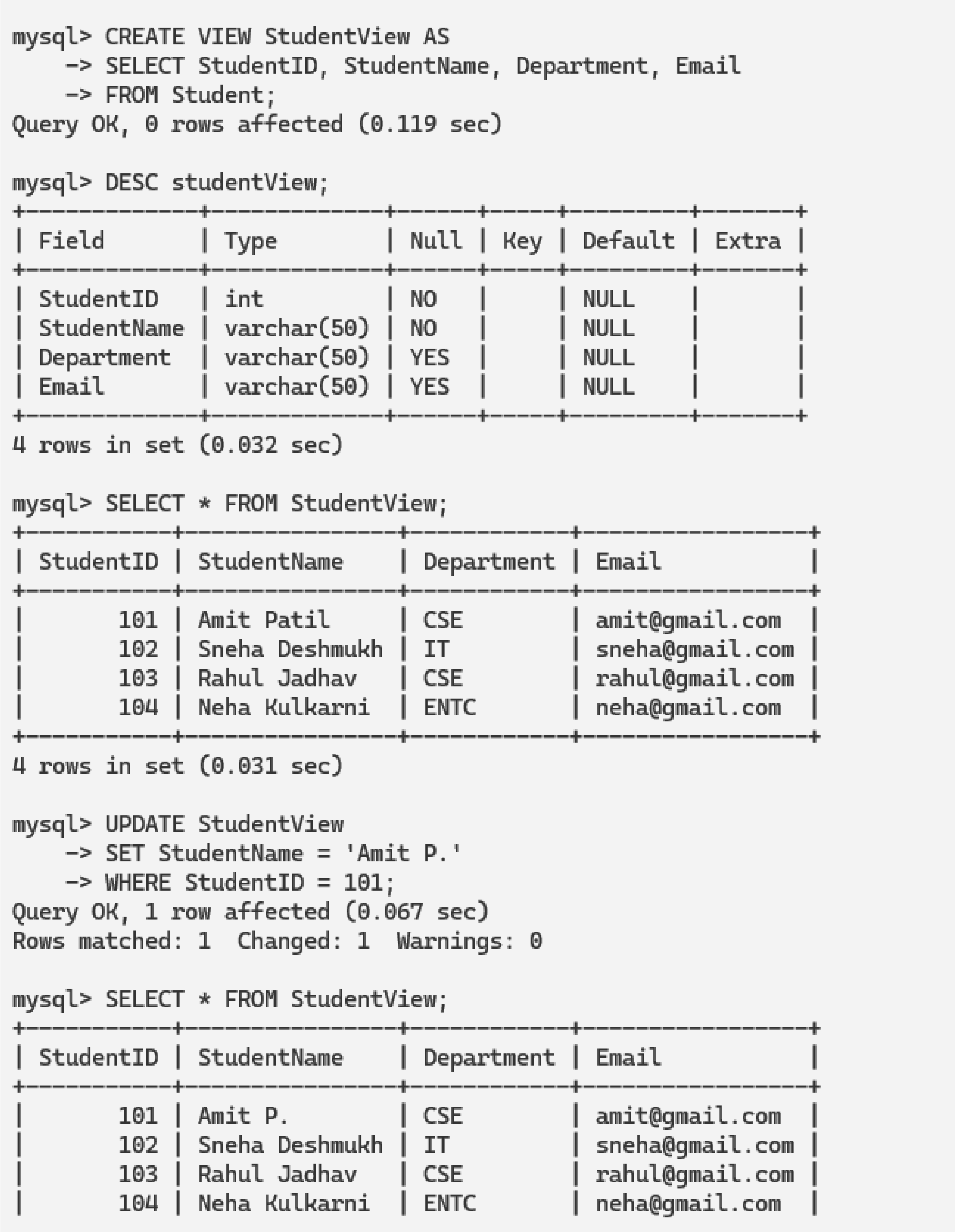
COMPLEX QUERIES



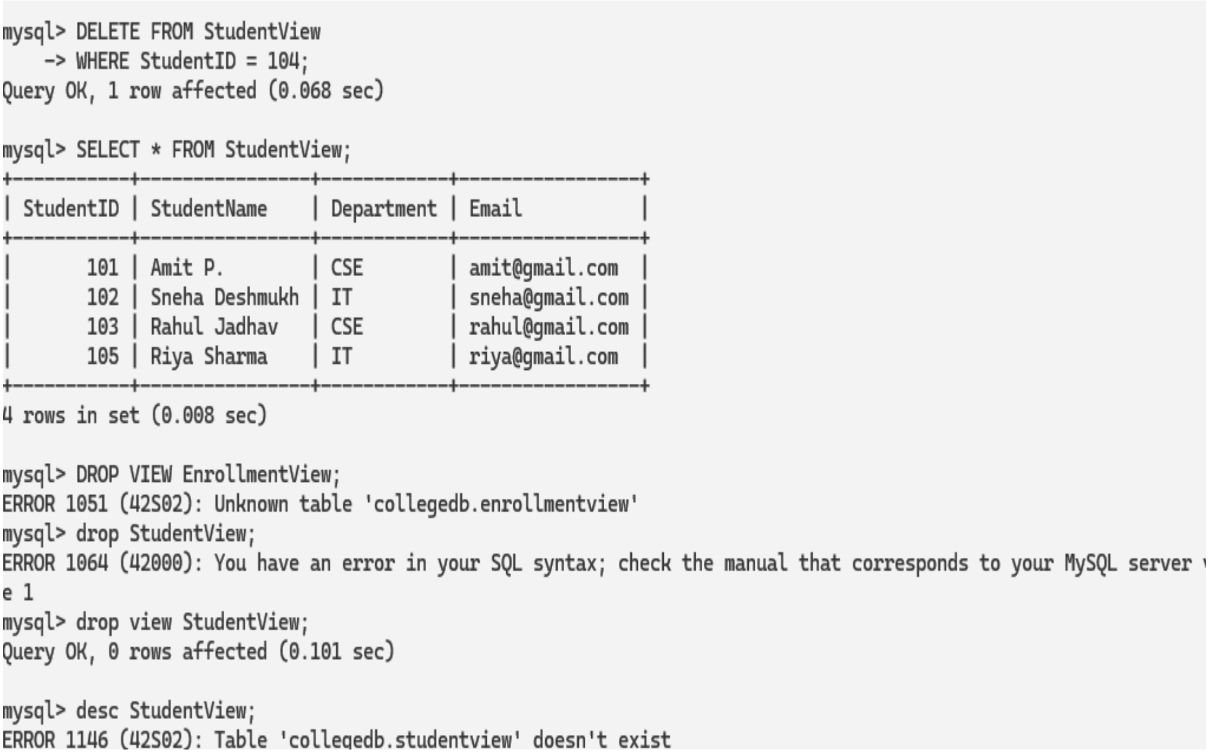
```
mysql> SELECT StudentName
    -> FROM Student
    -> WHERE StudentID IN (
    ->     SELECT StudentID
    ->     FROM Enrollment
    ->     WHERE CourseID = (
    ->         SELECT CourseID
    ->         FROM Course
    ->         WHERE CourseName = 'DBMS'
    ->     )
    -> );
Empty set (0.021 sec)

mysql> SELECT StudentName
    -> FROM Student
    -> WHERE StudentID IN (
    ->     SELECT StudentID
    ->     FROM Enrollment
    ->     WHERE CourseID IN (
    ->         SELECT CourseID
    ->         FROM Course
    ->         WHERE FacultyID = 1
    ->     )
    -> );
Empty set (0.010 sec)

mysql> SELECT StudentName
    -> FROM Student
    -> WHERE (SELECT SUM(Credits)
    ->        FROM Course
    ->        WHERE CourseID IN
    ->              (SELECT CourseID
    ->               FROM Enrollment
    ->               WHERE StudentID = Student.StudentID)
    ->       ) > 5;
```

PRACTICAL NO:07

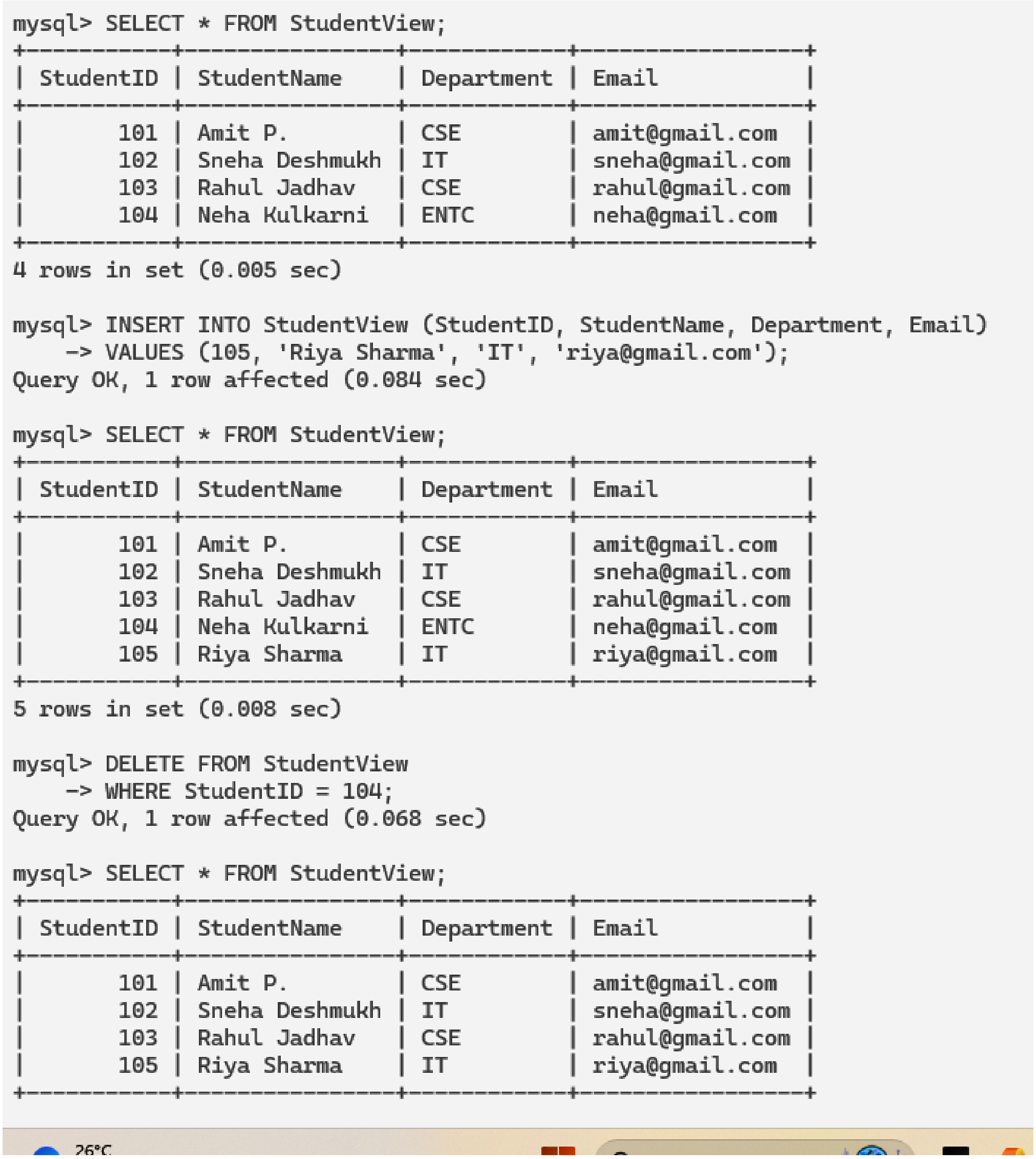
Creating a VIEW (DDL)



```
mysql> CREATE VIEW StudentView AS
    -> SELECT StudentID, StudentName, Department, Email
    -> FROM Student;
Query OK, 0 rows affected (0.119 sec)

mysql> DESC studentView;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| StudentID   | int         | NO   |     | NULL    |       |
| StudentName | varchar(50) | NO   |     | NULL    |       |
| Department  | varchar(50) | YES  |     | NULL    |       |
| Email       | varchar(50) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
4 rows in set (0.032 sec)

mysql> SELECT * FROM StudentView;
+-----------+----------------+------------+-----------------+
| StudentID | StudentName    | Department | Email           |
+-----------+----------------+------------+-----------------+
|       101 | Amit Patil     | CSE        | amit@gmail.com  |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com |
|       104 | Neha Kulkarni  | ENTC       | neha@gmail.com  |
+-----------+----------------+------------+-----------------+
4 rows in set (0.031 sec)

mysql> UPDATE StudentView
    -> SET StudentName = 'Amit P.'
    -> WHERE StudentID = 101;
Query OK, 1 row affected (0.067 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> SELECT * FROM StudentView;
+-----------+----------------+------------+-----------------+
| StudentID | StudentName    | Department | Email           |
+-----------+----------------+------------+-----------------+
|       101 | Amit P.        | CSE        | amit@gmail.com  |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com |
|       104 | Neha Kulkarni  | ENTC       | neha@gmail.com  |
```



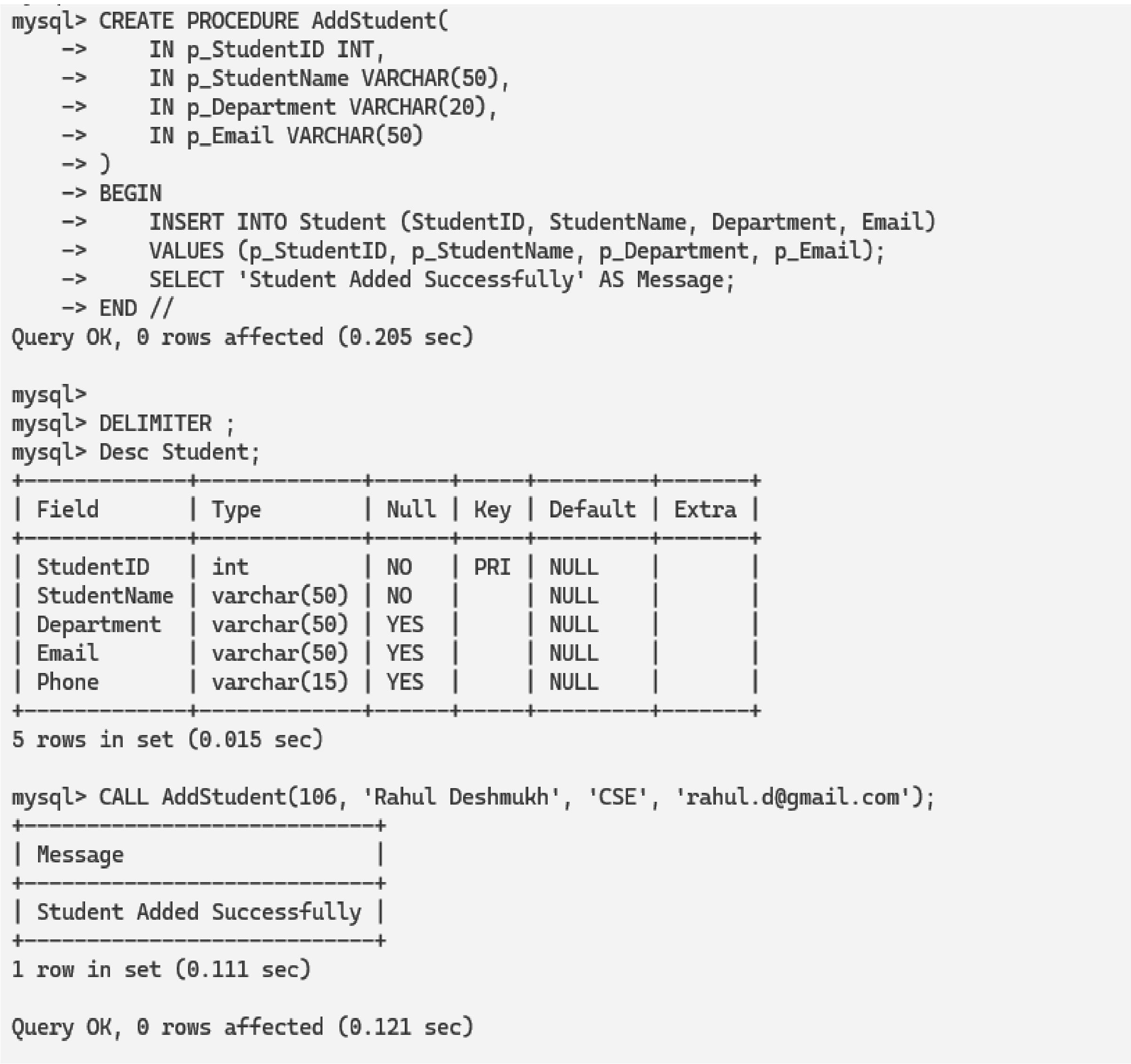
```
mysql> DELETE FROM StudentView
    -> WHERE StudentID = 104;
Query OK, 1 row affected (0.068 sec)

mysql> SELECT * FROM StudentView;
+-----------+----------------+------------+-----------------+
| StudentID | StudentName    | Department | Email           |
+-----------+----------------+------------+-----------------+
|       101 | Amit P.        | CSE        | amit@gmail.com  |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com |
|       105 | Riya Sharma    | IT         | riya@gmail.com  |
+-----------+----------------+------------+-----------------+
4 rows in set (0.008 sec)

mysql> DROP VIEW EnrollmentView;
ERROR 1051 (42S02): Unknown table 'collegedb.enrollmentview'
mysql> drop StudentView;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server v
e 1
mysql> drop view StudentView;
Query OK, 0 rows affected (0.101 sec)

mysql> desc StudentView;
ERROR 1146 (42S02): Table 'collegedb.studentview' doesn't exist
```



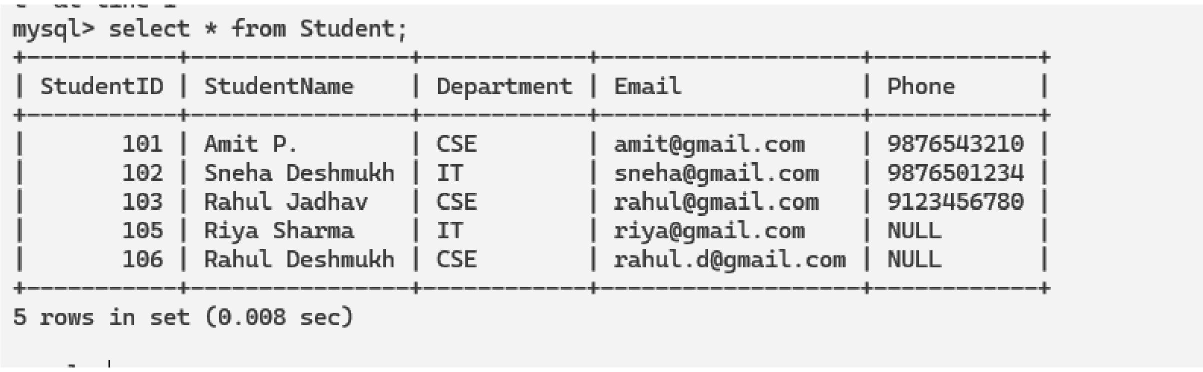
```
mysql> SELECT * FROM StudentView;
+-----------+----------------+------------+-----------------+
| StudentID | StudentName    | Department | Email           |
+-----------+----------------+------------+-----------------+
|       101 | Amit P.        | CSE        | amit@gmail.com  |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com |
|       104 | Neha Kulkarni  | ENTC       | neha@gmail.com  |
+-----------+----------------+------------+-----------------+
4 rows in set (0.005 sec)

mysql> INSERT INTO StudentView (StudentID, StudentName, Department, Email)
    -> VALUES (105, 'Riya Sharma', 'IT', 'riya@gmail.com');
Query OK, 1 row affected (0.084 sec)

mysql> SELECT * FROM StudentView;
+-----------+----------------+------------+-----------------+
| StudentID | StudentName    | Department | Email           |
+-----------+----------------+------------+-----------------+
|       101 | Amit P.        | CSE        | amit@gmail.com  |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com |
|       104 | Neha Kulkarni  | ENTC       | neha@gmail.com  |
|       105 | Riya Sharma    | IT         | riya@gmail.com  |
+-----------+----------------+------------+-----------------+
5 rows in set (0.008 sec)

mysql> DELETE FROM StudentView
    -> WHERE StudentID = 104;
Query OK, 1 row affected (0.068 sec)

mysql> SELECT * FROM StudentView;
+-----------+----------------+------------+-----------------+
| StudentID | StudentName    | Department | Email           |
+-----------+----------------+------------+-----------------+
|       101 | Amit P.        | CSE        | amit@gmail.com  |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com |
|       105 | Riya Sharma    | IT         | riya@gmail.com  |
+-----------+----------------+------------+-----------------+
```

PRACTICAL NO :08

STORED PROCEDURE

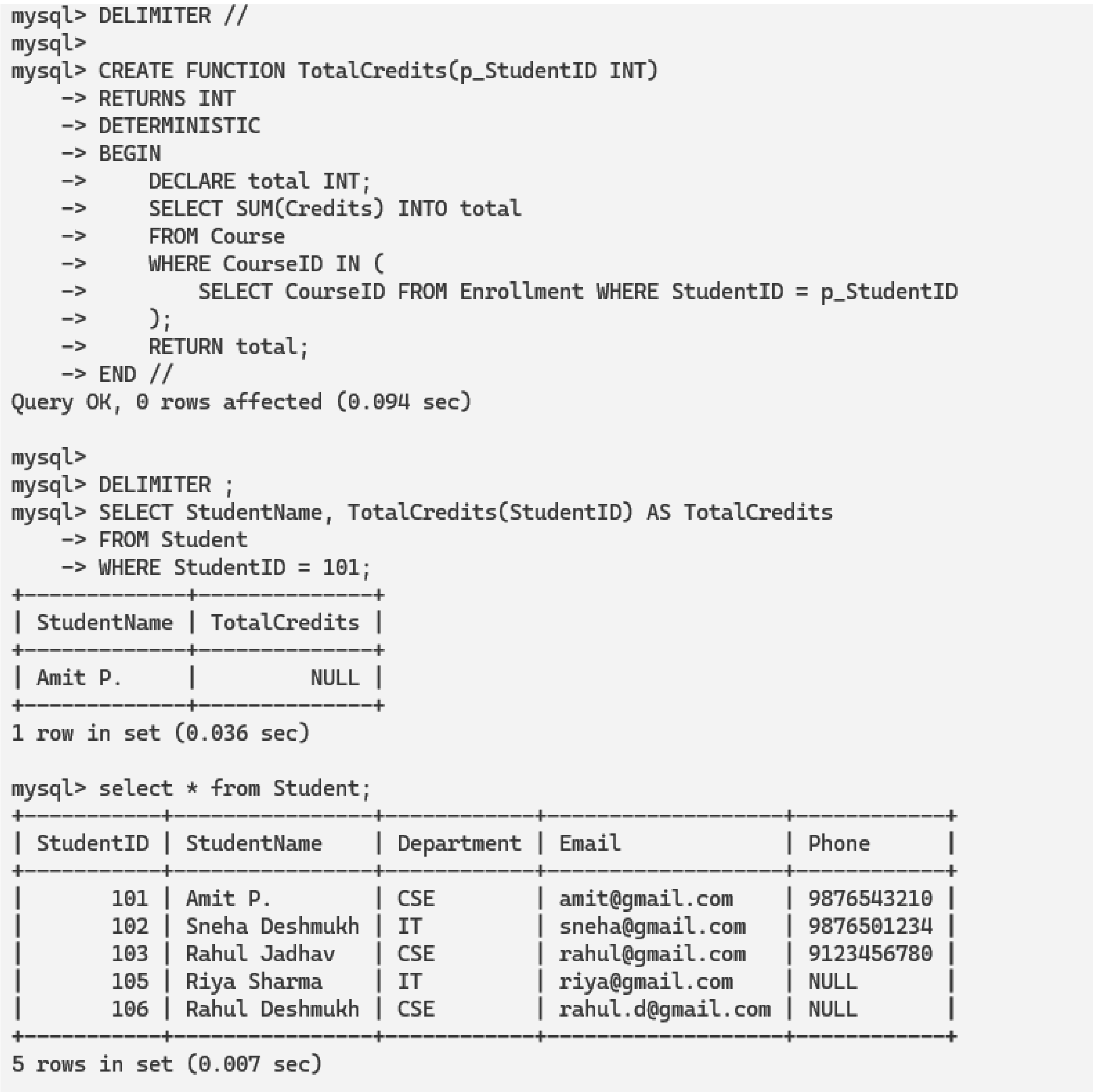


```
mysql> CREATE PROCEDURE AddStudent(
    ->     IN p_StudentID INT,
    ->     IN p_StudentName VARCHAR(50),
    ->     IN p_Department VARCHAR(20),
    ->     IN p_Email VARCHAR(50)
    -> )
    -> BEGIN
    ->     INSERT INTO Student (StudentID, StudentName, Department, Email)
    ->     VALUES (p_StudentID, p_StudentName, p_Department, p_Email);
    ->     SELECT 'Student Added Successfully' AS Message;
    -> END //
Query OK, 0 rows affected (0.205 sec)

mysql>
mysql> DELIMITER ;
mysql> Desc Student;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| StudentID   | int         | NO   | PRI | NULL    |       |
| StudentName | varchar(50) | NO   |     | NULL    |       |
| Department  | varchar(50) | YES  |     | NULL    |       |
| Email       | varchar(50) | YES  |     | NULL    |       |
| Phone       | varchar(15) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
5 rows in set (0.015 sec)

mysql> CALL AddStudent(106, 'Rahul Deshmukh', 'CSE', 'rahul.d@gmail.com');
+----------------------------+
| Message                    |
+----------------------------+
| Student Added Successfully |
+----------------------------+
1 row in set (0.111 sec)

Query OK, 0 rows affected (0.121 sec)
```

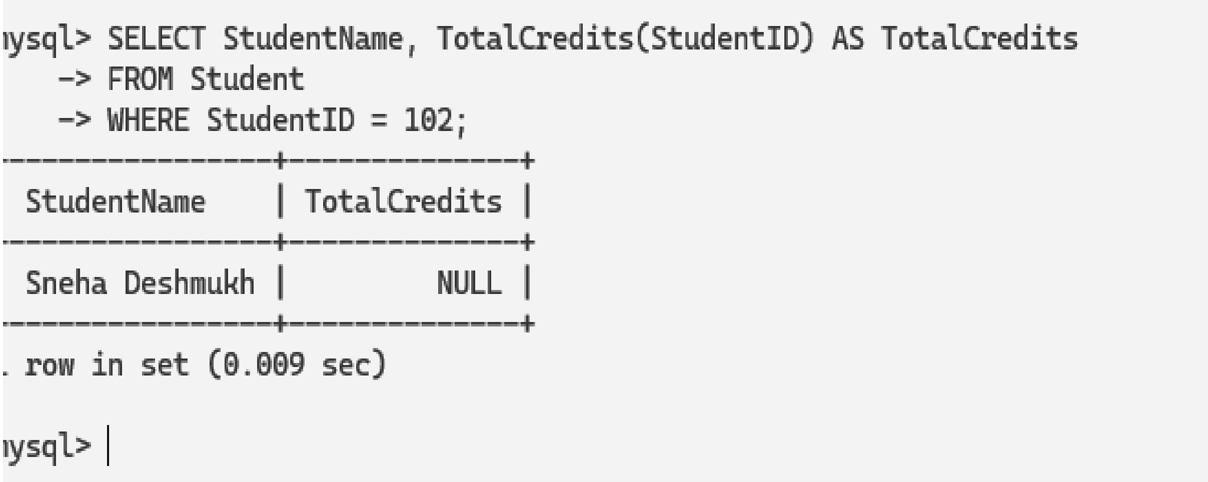


```
mysql> select * from Student;
+-----------+----------------+------------+-------------------+------------+
| StudentID | StudentName    | Department | Email             | Phone      |
+-----------+----------------+------------+-------------------+------------+
|       101 | Amit P.        | CSE        | amit@gmail.com    | 9876543210 |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com   | 9876501234 |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com   | 9123456780 |
|       105 | Riya Sharma    | IT         | riya@gmail.com    | NULL       |
|       106 | Rahul Deshmukh | CSE        | rahul.d@gmail.com | NULL       |
+-----------+----------------+------------+-------------------+------------+
5 rows in set (0.008 sec)
```

STORED FUNCTION:



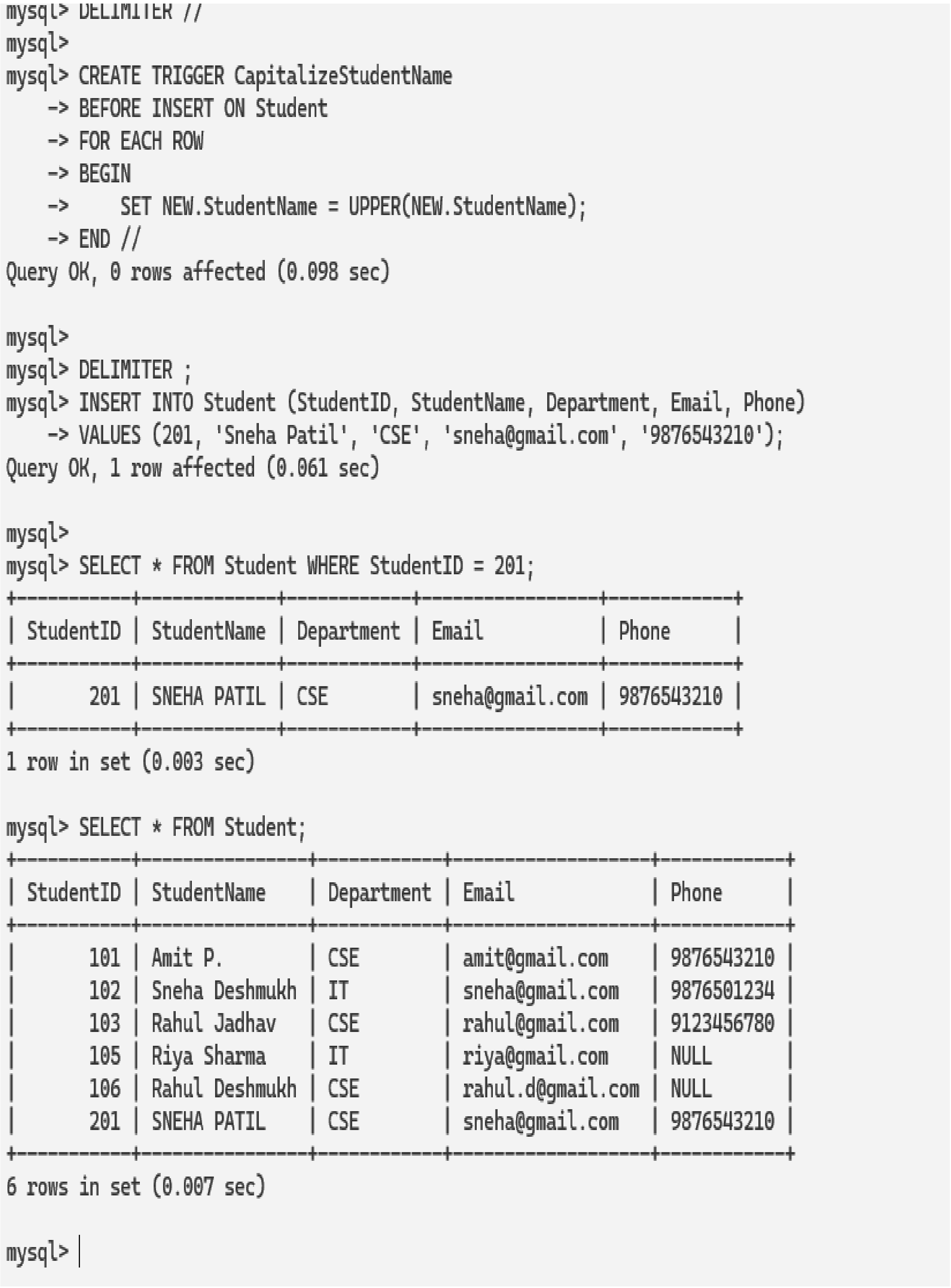
```
mysql> DELIMITER //
mysql>
mysql> CREATE FUNCTION TotalCredits(p_StudentID INT)
    -> RETURNS INT
    -> DETERMINISTIC
    -> BEGIN
    ->     DECLARE total INT;
    ->     SELECT SUM(Credits) INTO total
    ->     FROM Course
    ->     WHERE CourseID IN (
    ->         SELECT CourseID FROM Enrollment WHERE StudentID = p_StudentID
    ->     );
    ->     RETURN total;
    -> END //
Query OK, 0 rows affected (0.094 sec)

mysql>
mysql> DELIMITER ;
mysql> SELECT StudentName, TotalCredits(StudentID) AS TotalCredits
    -> FROM Student
    -> WHERE StudentID = 101;
+-------------+--------------+
| StudentName | TotalCredits |
+-------------+--------------+
| Amit P.     |         NULL |
+-------------+--------------+
1 row in set (0.036 sec)

mysql> select * from Student;
+-----------+----------------+------------+-------------------+------------+
| StudentID | StudentName    | Department | Email             | Phone      |
+-----------+----------------+------------+-------------------+------------+
|       101 | Amit P.        | CSE        | amit@gmail.com    | 9876543210 |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com   | 9876501234 |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com   | 9123456780 |
|       105 | Riya Sharma    | IT         | riya@gmail.com    | NULL       |
|       106 | Rahul Deshmukh | CSE        | rahul.d@gmail.com | NULL       |
+-----------+----------------+------------+-------------------+------------+
5 rows in set (0.007 sec)
```



```
ysql> SELECT StudentName, TotalCredits(StudentID) AS TotalCredits
   -> FROM Student
   -> WHERE StudentID = 102;
-----------------+--------------+
 StudentName     | TotalCredits |
-----------------+--------------+
 Sneha Deshmukh |         NULL |
-----------------+--------------+
. row in set (0.009 sec)

ysql>
```

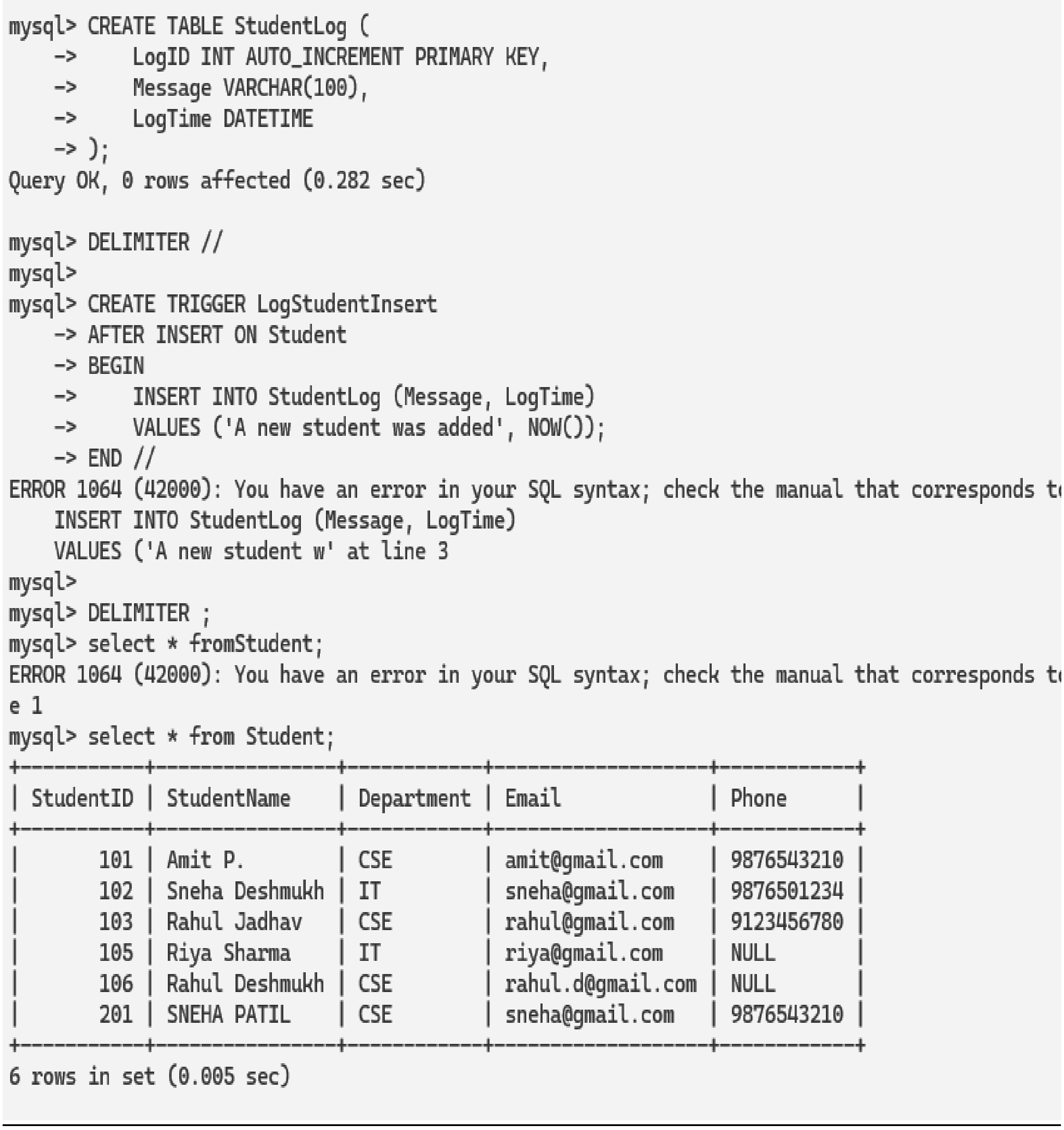
PRCTICAL NO :09

ROW-LEVEL TRIGGER



```
mysql> DELIMITER //
mysql>
mysql> CREATE TRIGGER CapitalizeStudentName
    -> BEFORE INSERT ON Student
    -> FOR EACH ROW
    -> BEGIN
    ->     SET NEW.StudentName = UPPER(NEW.StudentName);
    -> END //
Query OK, 0 rows affected (0.098 sec)

mysql>
mysql> DELIMITER ;
mysql> INSERT INTO Student (StudentID, StudentName, Department, Email, Phone)
    -> VALUES (201, 'Sneha Patil', 'CSE', 'sneha@gmail.com', '9876543210');
Query OK, 1 row affected (0.061 sec)

mysql>
mysql> SELECT * FROM Student WHERE StudentID = 201;
+-----------+-------------+------------+-----------------+------------+
| StudentID | StudentName | Department | Email           | Phone      |
+-----------+-------------+------------+-----------------+------------+
|       201 | SNEHA PATIL | CSE        | sneha@gmail.com | 9876543210 |
+-----------+-------------+------------+-----------------+------------+
1 row in set (0.003 sec)

mysql> SELECT * FROM Student;
+-----------+-----------------+------------+-------------------+------------+
| StudentID | StudentName     | Department | Email             | Phone      |
+-----------+-----------------+------------+-------------------+------------+
|       101 | Amit P.         | CSE        | amit@gmail.com    | 9876543210 |
|       102 | Sneha Deshmukh  | IT         | sneha@gmail.com   | 9876501234 |
|       103 | Rahul Jadhav    | CSE        | rahul@gmail.com   | 9123456780 |
|       105 | Riya Sharma     | IT         | riya@gmail.com    | NULL       |
|       106 | Rahul Deshmukh  | CSE        | rahul.d@gmail.com | NULL       |
|       201 | SNEHA PATIL     | CSE        | sneha@gmail.com   | 9876543210 |
+-----------+-----------------+------------+-------------------+------------+
6 rows in set (0.007 sec)

mysql>
```

2)STATEMENT-LEVEL TRIGGER



```
mysql> CREATE TABLE StudentLog (
    ->     LogID INT AUTO_INCREMENT PRIMARY KEY,
    ->     Message VARCHAR(100),
    ->     LogTime DATETIME
    -> );
Query OK, 0 rows affected (0.282 sec)

mysql> DELIMITER //
mysql>
mysql> CREATE TRIGGER LogStudentInsert
    -> AFTER INSERT ON Student
    -> BEGIN
    ->     INSERT INTO StudentLog (Message, LogTime)
    ->     VALUES ('A new student was added', NOW());
    -> END //
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds t
    INSERT INTO StudentLog (Message, LogTime)
    VALUES ('A new student w' at line 3
mysql>
mysql> DELIMITER ;
mysql> select * fromStudent;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds t
e 1
mysql> select * from Student;
+-----------+----------------+------------+-------------------+------------+
| StudentID | StudentName    | Department | Email             | Phone      |
+-----------+----------------+------------+-------------------+------------+
|       101 | Amit P.        | CSE        | amit@gmail.com    | 9876543210 |
|       102 | Sneha Deshmukh | IT         | sneha@gmail.com   | 9876501234 |
|       103 | Rahul Jadhav   | CSE        | rahul@gmail.com   | 9123456780 |
|       105 | Riya Sharma    | IT         | riya@gmail.com    | NULL       |
|       106 | Rahul Deshmukh | CSE        | rahul.d@gmail.com | NULL       |
|       201 | SNEHA PATIL    | CSE        | sneha@gmail.com   | 9876543210 |
+-----------+----------------+------------+-------------------+------------+
6 rows in set (0.005 sec)
```

PRACTICAL NO:10

1) **IMPLICIT CURSOR (PL/SQL)**

```
SET SERVEROUTPUT ON;

BEGIN
   UPDATE Student
   SET Department = 'CSE'
   WHERE StudentID = 201;

   DBMS_OUTPUT.PUT_LINE('Rows affected: ' || SQL%ROWCOUNT);
END;
/
```

OUTPUT:

```
Rows affected: 1
```

2) IMPLICIT CURSOR (SELECT INTO)

```
SET SERVEROUTPUT ON;

DECLARE
   v_name Student.StudentName%TYPE;
BEGIN
   SELECT StudentName
   INTO v_name
   FROM Student

   WHERE StudentID = 201;

   DBMS_OUTPUT.PUT_LINE('Student Name: ' || v_name);
END;
/
```

OUTPUT:

```
Student Name: SNEHA PATIL
```