mysql> create database student;

Query OK, 1 row affected (0.01 sec)

mysql> use student;

Database changed

mysql> CREATE TABLE students (

-> student\_id INT PRIMARY KEY,

-> student\_name VARCHAR(100),

-> age INT,

-> grade VARCHAR(2)

-> );

Query OK, 0 rows affected (0.02 sec)

mysql> CREATE TABLE courses (

-> course\_id INT PRIMARY KEY,

-> course\_name VARCHAR(100),

-> credits INT

-> );

Query OK, 0 rows affected (0.02 sec)

mysql> CREATE TABLE enrollments (

-> 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 (0.03 sec)

mysql> INSERT INTO students (student\_id, student\_name, age, grade) VALUES (1, 'Alice Johnson', 20, 'A');

Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO students (student\_id, student\_name, age, grade) VALUES (2, 'Bob Smith', 21, 'B');

Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO students (student\_id, student\_name, age, grade) VALUES (3, 'Charlie Davis', 22, 'A');

Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO courses (course\_id, course\_name, credits) VALUES (101, 'Math 101', 3);

Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO courses (course\_id, course\_name, credits) VALUES (102, 'Physics 101', 4);

Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO courses (course\_id, course\_name, credits) VALUES (103, 'Chemistry 101', 3);

Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO enrollments (student\_id, course\_id, enrollment\_date) VALUES (1, 101, '2024-01-10');

Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO enrollments (student\_id, course\_id, enrollment\_date) VALUES (1, 102, '2024-01-10');

Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO enrollments (student\_id, course\_id, enrollment\_date) VALUES (2, 103, '2024-01-12');

Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO enrollments (student\_id, course\_id, enrollment\_date) VALUES (3, 101, '2024-01-15');

Query OK, 1 row affected (0.01 sec)

mysql> SELECT s.student\_name, c.course\_name

-> FROM students s

-> INNER JOIN enrollments e ON s.student\_id = e.student\_id

-> INNER JOIN courses c ON e.course\_id = c.course\_id;

+---------------+---------------+

| student\_name | course\_name |

+---------------+---------------+

| Alice Johnson | Math 101 |

| Alice Johnson | Physics 101 |

| Bob Smith | Chemistry 101 |

| Charlie Davis | Math 101 |

+---------------+---------------+

4 rows in set (0.01 sec)

mysql> SELECT s.student\_name, c.course\_name

-> FROM students s

-> LEFT JOIN enrollments e ON s.student\_id = e.student\_id

-> LEFT JOIN courses c ON e.course\_id = c.course\_id;

+---------------+---------------+

| student\_name | course\_name |

+---------------+---------------+

| Alice Johnson | Math 101 |

| Alice Johnson | Physics 101 |

| Bob Smith | Chemistry 101 |

| Charlie Davis | Math 101 |

+---------------+---------------+

4 rows in set (0.01 sec)

mysql> SELECT c.course\_name, s.student\_name

-> FROM courses c

-> RIGHT JOIN enrollments e ON c.course\_id = e.course\_id

-> RIGHT JOIN students s ON e.student\_id = s.student\_id;

+---------------+---------------+

| course\_name | student\_name |

+---------------+---------------+

| Math 101 | Alice Johnson |

| Physics 101 | Alice Johnson |

| Chemistry 101 | Bob Smith |

| Math 101 | Charlie Davis |

+---------------+---------------+

4 rows in set (0.00 sec)

mysql> SELECT s.student\_name, c.course\_name

-> FROM students s

-> LEFT JOIN enrollments e ON s.student\_id = e.student\_id

-> LEFT JOIN courses c ON e.course\_id = c.course\_id

-> UNION

-> SELECT s.student\_name, c.course\_name

-> FROM courses c

-> LEFT JOIN enrollments e ON c.course\_id = e.course\_id

-> LEFT JOIN students s ON e.student\_id = s.student\_id;

+---------------+---------------+

| student\_name | course\_name |

+---------------+---------------+

| Alice Johnson | Math 101 |

| Alice Johnson | Physics 101 |

| Bob Smith | Chemistry 101 |

| Charlie Davis | Math 101 |

+---------------+---------------+

4 rows in set (0.01 sec)

mysql> SELECT s1.student\_name AS Student1, s2.student\_name AS Student2, c.course\_name

-> FROM students s1

-> INNER JOIN enrollments e1 ON s1.student\_id = e1.student\_id

-> INNER JOIN courses c ON e1.course\_id = c.course\_id

-> INNER JOIN enrollments e2 ON e1.course\_id = e2.course\_id

-> INNER JOIN students s2 ON e2.student\_id = s2.student\_id

-> WHERE s1.student\_id < s2.student\_id;

+---------------+---------------+-------------+

| Student1 | Student2 | course\_name |

+---------------+---------------+-------------+

| Alice Johnson | Charlie Davis | Math 101 |

+---------------+---------------+-------------+

1 row in set (0.01 sec)

mysql> CREATE VIEW student\_courses AS

-> SELECT s.student\_name, c.course\_name

-> FROM students s

-> INNER JOIN enrollments e ON s.student\_id = e.student\_id

-> INNER JOIN courses c ON e.course\_id = c.course\_id;

Query OK, 0 rows affected (0.02 sec)

mysql> SELECT \* FROM student\_courses;

+---------------+---------------+

| student\_name | course\_name |

+---------------+---------------+

| Alice Johnson | Math 101 |

| Alice Johnson | Physics 101 |

| Bob Smith | Chemistry 101 |

| Charlie Davis | Math 101 |

+---------------+---------------+

4 rows in set (0.00 sec)

mysql> CREATE VIEW grade\_a\_students AS

-> SELECT s.student\_name, s.grade

-> FROM students s

-> WHERE s.grade = 'A';

Query OK, 0 rows affected (0.01 sec)

mysql> SELECT \* FROM grade\_a\_students;

+---------------+-------+

| student\_name | grade |

+---------------+-------+

| Alice Johnson | A |

| Charlie Davis | A |

+---------------+-------+

2 rows in set (0.00 sec)

mysql> CREATE VIEW course\_student\_count AS

-> SELECT c.course\_name, COUNT(e.student\_id) AS student\_count

-> FROM courses c

-> LEFT JOIN enrollments e ON c.course\_id = e.course\_id

-> GROUP BY c.course\_name;

Query OK, 0 rows affected (0.01 sec)

mysql> SELECT \* FROM course\_student\_count;

+---------------+---------------+

| course\_name | student\_count |

+---------------+---------------+

| Math 101 | 2 |

| Physics 101 | 1 |

| Chemistry 101 | 1 |

+---------------+---------------+

3 rows in set (0.01 sec)