EXPERIMENT-01

- **AIM:** To design and manipulate a University Database using SQL that involves creating relational tables for Students, Courses, Enrollments, and Professors, inserting and retrieving data using JOINs, managing access control with GRANT/REVOKE, and handling transaction control using COMMIT and ROLLBACK.

- **THEORY:** Relational databases store data in tables with relationships among them. SQL (Structured Query Language) allows data manipulation and definition. This experiment demonstrates:

➢ Table creation using CREATE TABLE
➢ Data insertion using INSERT INTO
➢ Data retrieval using SELECT and JOIN
➢ Access control using GRANT and REVOKE
➢ Transaction control using COMMIT and ROLLBACK

- **CODE:**

1. CREATING TABLES:

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

CREATE TABLE Professors (
    professor_id INT PRIMARY KEY,
    name VARCHAR(100),
    department VARCHAR(50)
);
```

```
CREATE TABLE Courses (
    course_id INT PRIMARY KEY,
    course_name VARCHAR(100),
    professor_id INT,
    FOREIGN KEY (professor_id) REFERENCES Professors(professor_id)
);

CREATE TABLE Enrollments (
    enrollment_id INT PRIMARY KEY,
    student_id INT,
    course_id INT,
    grade CHAR(2),
    FOREIGN KEY (student_id) REFERENCES Students(student_id),
    FOREIGN KEY (course_id) REFERENCES Courses(course_id)
);
```

2. **INSERTING TABLES:**

```
-- Students
INSERT INTO Students VALUES (1, 'Alice', 20, 'Computer Science');
INSERT INTO Students VALUES (2, 'Bob', 21, 'Physics');

-- Professors
INSERT INTO Professors VALUES (101, 'Dr. Smith', 'Computer Science');
INSERT INTO Professors VALUES (102, 'Dr. Ray', 'Physics');

-- Courses
INSERT INTO Courses VALUES (201, 'DBMS', 101);
INSERT INTO Courses VALUES (202, 'Quantum Mechanics', 102);

-- Enrollments
```

```
INSERT INTO Enrollments VALUES (301, 1, 201, 'A');
INSERT INTO Enrollments VALUES (302, 2, 202, 'B');
```

- **OUTPUTS:**

Result Grid | Filter Rows: | Edit:

enrollment_id	student_id	course_id	grade
302	2	202	B
NULL	NULL	NULL	NULL

professor_id	name	department
102	Dr. Ray	Physics
NULL	NULL	NULL

student_id	name	age	major
2	Bob	21	Physics
NULL	NULL	NULL	NULL

- **LEARNING OUTCOMES:**

➢ Understand relational table creation.
➢ Learn SQL INSERT and JOIN operations.
➢ Apply GRANT and REVOKE for access control.