Experiment 1

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1. **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.

2. **Tools Used:**

   SQL Server Management Studio 21 (SSMS) code editor.

3. **Experiment:**

   1. Easy-Level Problem: Author-Book Relationship Using Joins and Basic SQL Operations.
      - Design two tables — one for storing author details and the other for book details.
      - Ensure a foreign key relationship from the book to its respective author.
      - Insert at least three records in each table.
      - Perform an INNER JOIN to link each book with its author using the common author ID.
      - Select the book title, author name, and author's country.

   2. Medium-Level Problem: Department-Course Subquery and Access Control.

      - Design normalized tables for departments and the courses they offer, maintaining a foreign key relationship.

      - Insert five departments and at least ten courses across those departments.

- Use a subquery to count the number of courses under each department.
- Filter and retrieve only those departments that offer more than two courses.

- Grant SELECT-only access on the courses table to a specific user.

4. Output:
Easy-Level
Author Table

	Author Id	Author Name	Country
1	120	Ruskin Bond	India
2	130	Robert Greene	USA
3	145	Dale Carnegie	USA
4	250	Robert Frost	USA

Books Table

	ID	Name	Author Id
1	200	Influence	145
2	202	Room on the Roof	120
3	204	Blue Umbrella	120
4	206	Human Nature	130

INNER JOIN

	Book Name	Author Name	Country
1	Influence	Dale Carnegie	USA
2	Room on the Roof	Ruskin Bond	India
3	Blue Umbrella	Ruskin Bond	India
4	Human Nature	Robert Greene	USA

Medium-Level
Department Table

	Dept_Id	Dept_Name
1	201	AI&ML
2	204	CSE
3	207	Bio-Tech
4	210	Finance
5	213	Psychology

Course Table

	Dept	Course
1	201	Data Science
2	201	Neural Net
3	207	Biology
4	204	Full Stacks
5	210	Economics
6	210	Socio-Psycho
7	213	Socio-Psycho
8	213	Psychology

Subquery to Count

	Department	Dept_Id	COUNT
1	AI&ML	201	2
2	CSE	204	1
3	Bio-Tech	207	1
4	Finance	210	2
5	Psychology	213	2

Department with more than 2 courses

	Department	Dept_Id
1	AI&ML	201
2	Finance	210
3	Psychology	213

5. Learning Outcomes:
   - Learn't about SQL Basic Operations.
   - Learn't about various types of JOINS such as FULL JOIN, INNER JOIN, LEFT & RIGHT JOIN.
   - Learn't about foreign key and its implementation in actual scenario.
   - Learn't how to perform subquery and implement filter along with subquery.
   - Learn't about basic TCP command such as GRANT.