Experiment 1.1

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Subject Name: DBMS **Subject Code: 23CSH-205**

1. **Problem Title:** Author-Book Relationship Using Joins and Basic SQL Operations

2. **Procedure (Step-by-Step):**
   1.Design two tables — one for storing author details and the other for book details.
   2.Ensure a foreign key relationship from the book to its respective author.
   3.Insert at least three records in each table.
   4.Perform an INNER JOIN to link each book with its author using the common author ID.
   5.Select the book title, author name, and author's country.

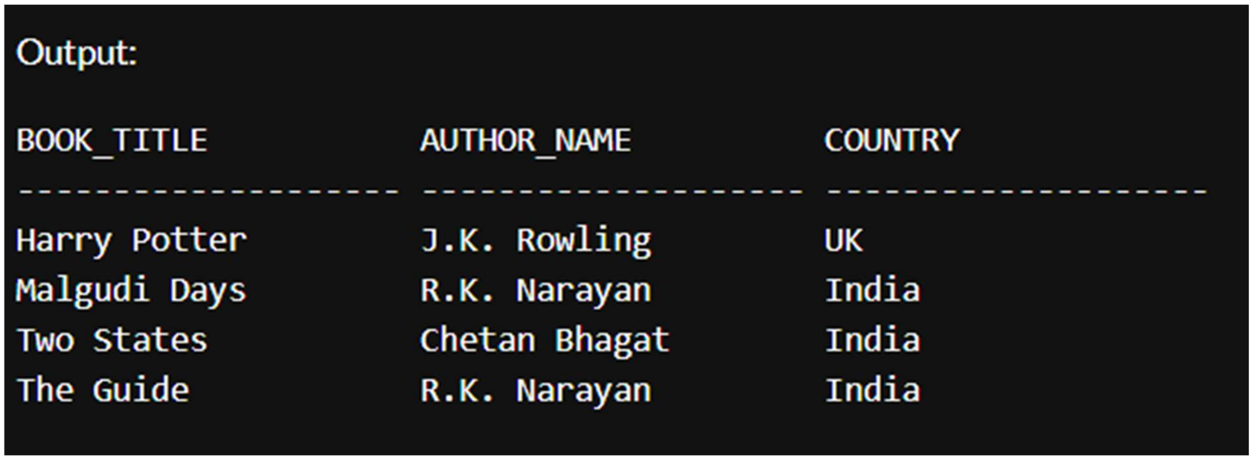
Sample Output Description:
When the join is performed, we get a list where each book title is shown along with its author's name and their country.

3. **Code:**

```
-- Create the author table
CREATE TABLE TBL_AUTHOR
```

```
(

AUTHOR_ID INT PRIMARY KEY,

AUTHOR_NAME VARCHAR(20),

COUNTRY VARCHAR(20)
);
GO


-- Create the book table with a foreign key
CREATE TABLE TBL_BOOK
(

BOOK_ID INT PRIMARY KEY,

BOOK_TITLE VARCHAR(20),

AUHTORID INT,

FOREIGN KEY (AUHTORID) REFERENCES
TBL_AUTHOR(AUTHOR_ID) -- Used to maintain referential integrity
);
GO


-- Insert values into TBL_AUTHOR
```

```
INSERT INTO TBL_AUTHOR (AUTHOR_ID, AUTHOR_NAME,
COUNTRY) VALUES

(1, 'J.K. Rowling', 'UK'),

(2, 'R.K. Narayan', 'India'),

(3, 'Chetan Bhagat', 'India');

GO


-- Insert values into TBL_BOOK

INSERT INTO TBL_BOOK (BOOK_ID, BOOK_TITLE, AUHTORID)
VALUES

(101, 'Harry Potter', 1),

(102, 'Malgudi Days', 2),

(103, 'Two States', 3),

(104, 'The Guide', 2);

GO


-- Select and join data from both tables

SELECT B.BOOK_TITLE, A.AUTHOR_NAME, A.COUNTRY

FROM TBL_BOOK AS B

INNER JOIN

TBL_AUTHOR AS A

ON

B.AUHTORID = A.AUTHOR_ID;

GO
```


```
Output:

BOOK_TITLE           AUTHOR_NAME          COUNTRY
-------------------- -------------------- --------------------
Harry Potter         J.K. Rowling         UK
Malgudi Days         R.K. Narayan         India
Two States           Chetan Bhagat        India
The Guide            R.K. Narayan         India
```

Medium-Level Problem

Problem Title: Department-Course Subquery and Access Control

Procedure (Step-by-Step):

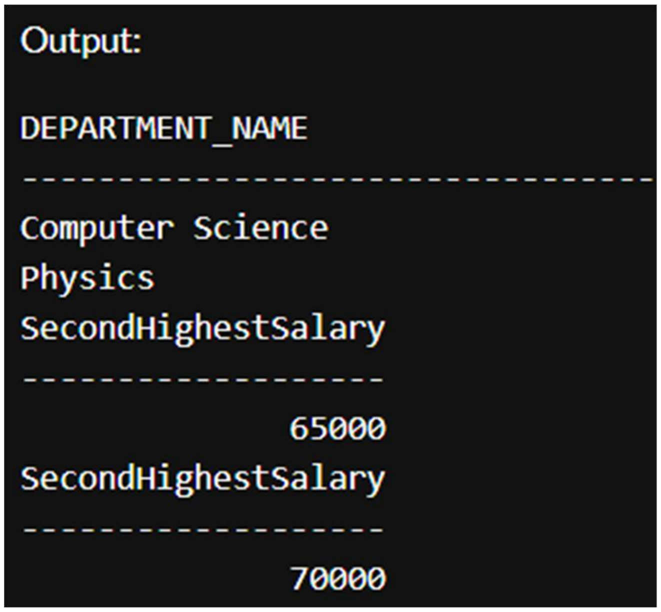
1. Design normalized tables for departments and the courses they offer, maintaining a foreign key relationship.
2. Insert five departments and at least ten courses across those departments.
3. Use a subquery to count the number of courses under each department. - GROUP BY

4. **Code:**

```
DROP TABLE IF EXISTS COURSES;

DROP TABLE IF EXISTS DEPARTMENTS;

GO


CREATE TABLE DEPARTMENTS (
    DEPTID INT PRIMARY KEY,
    DEPARTMENT_NAME VARCHAR(100) NOT NULL
);
GO

CREATE TABLE COURSES (
    COURSEID INT PRIMARY KEY,
    COURSE_NAME VARCHAR(100) NOT NULL,
    DEPTID INT,
    FOREIGN KEY (DEPTID) REFERENCES DEPARTMENTS(DEPTID)
);
GO

INSERT INTO DEPARTMENTS (DEPTID, DEPARTMENT_NAME) VALUES
(1, 'Computer Science'),
(2, 'Mathematics'),
(3, 'Physics'),
(4, 'History'),
(5, 'Art');
GO

INSERT INTO COURSES (COURSEID, COURSE_NAME, DEPTID) VALUES
(101, 'Introduction to Programming', 1),
(102, 'Data Structures', 1),
(103, 'Database Systems', 1),
(104, 'Operating Systems', 1),
(201, 'Calculus I', 2),
(202, 'Linear Algebra', 2),
(301, 'Classical Mechanics', 3),
(302, 'Electromagnetism', 3),
(303, 'Quantum Physics', 3),
(401, 'World History', 4),
(501, 'Drawing Fundamentals', 5);
GO

SELECT DEPARTMENT_NAME
FROM DEPARTMENTS
WHERE DEPTID IN (
   SELECT DEPTID
   FROM COURSES
   GROUP BY DEPTID
   HAVING COUNT(*) > 2
);
GO



BEGIN
CREATE USER UMANG WITHOUT LOGIN;
```

```
END
GO

GRANT SELECT ON COURSES TO UMANG;
GO

DROP TABLE IF EXISTS EMPLOYEE;
GO

CREATE TABLE EMPLOYEE (
    EMPID INT,
    EMPNAME VARCHAR(50),
    SALARY INT
);
GO

INSERT INTO EMPLOYEE (EMPID, EMPNAME, SALARY) VALUES
(1, 'Alice', 70000),
(2, 'Bob', 25000),
(3, 'Charlie', 65000),
(4, 'David', 32000),
(5, 'Eve', 70000);
GO
```

```
SELECT MAX(SALARY) AS SecondHighestSalary
FROM EMPLOYEE
WHERE SALARY < (SELECT MAX(SALARY) FROM EMPLOYEE);
GO

SELECT SALARY AS SecondHighestSalary
FROM EMPLOYEE
ORDER BY SALARY DESC
OFFSET 1 ROWS
FETCH NEXT 1 ROWS ONLY;
GO
```



Output:

```
DEPARTMENT_NAME
--------------------------------
Computer Science
Physics
SecondHighestSalary
-------------------
              65000
SecondHighestSalary
-------------------
              70000
```