Experiment 1

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Subject Name: Database management systems **Subject Code: 23CSP-333**

1. Aim:

To understand and apply fundamental SQL concepts for database design, data manipulation, and advanced querying techniques

2. Objective:

i) **Problem Title: Author-Book Relationship Using Joins and Basic SQL Operations**
Step-by-Step:
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.
Expected Output: Each book title along with its author's name and country.

ii) Problem Title: Department-Course Subquery and Access Control
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. Display only departments that offer more than 2 courses.

3. DBMS script and output:

1)
```
CREATE DATABASE KRG_1B;
USE KRG_1B;

CREATE TABLE TBL_AUTHOR (
AUTHOR_ID INT PRIMARY KEY,
AUTHOR_NAME VARCHAR(50),
COUNTRY VARCHAR(50)
);

CREATE TABLE TBL_BOOK (
BOOK_ID INT PRIMARY KEY,
BOOK_TITLE VARCHAR(50),
AUTHORID INT,
FOREIGN KEY (AUTHORID) REFERENCES TBL_AUTHOR(AUTHOR_ID)
);
```

```
INSERT INTO TBL_AUTHOR (AUTHOR_ID, AUTHOR_NAME, COUNTRY) VALUES
(1, 'R.K. Narayan', 'India'),
(2, 'J.K. Rowling', 'UK'),
(3, 'George Orwell', 'UK');

INSERT INTO TBL_BOOK (BOOK_ID, BOOK_TITLE, AUTHORID) VALUES
(101, 'Malgudi', 1),
(102, '1984', 3),
(103, 'HarryPotter', 2);

select * from TBL_AUTHOR
select * from TBL_BOOK

SELECT
B.BOOK_TITLE,
A.AUTHOR_NAME,
A.COUNTRY
FROM
TBL_BOOK AS B
INNER JOIN
TBL_AUTHOR AS A
ON
B.AUTHORID = A.A
```

2)

```
CREATE TABLE DEPARTMENTS (
    DEPTID INT PRIMARY KEY,
    DEPARTMENT_NAME VARCHAR(50)
);

CREATE TABLE COURSE (
    COURSE_ID INT PRIMARY KEY,
    COURSE_NAME VARCHAR(50),
    DEPTID INT,
    FOREIGN KEY (DEPTID) REFERENCES DEPARTMENTS(DEPTID)
);

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

INSERT INTO COURSE (COURSE_ID, COURSE_NAME, DEPTID) VALUES
(1, 'Data Structures', 1),
(2, 'Algorithms', 1),
(3, 'DBMS', 1),
(4, 'Circuits', 2),
(5, 'Signals', 2),
(6, 'Thermodynamics', 3),
(7, 'Fluid Mechanics', 3),
(8, 'Quantum Physics', 4),
(9, 'Linear Algebra', 5),
(10, 'Calculus', 5);

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

  );
```