



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Experiment 1

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Branch: CSE

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Subject Name: ADBMS

UID: 23BCS10187

Section/Group: KRG_2_B

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1. Aim:

- a) To create and relate author and book tables using foreign keys, and retrieve combined details using SQL INNER JOIN and basic operations.
- b) To design a relational database for managing departments and their offered courses, use subqueries to analyze course distribution, filter departments based on course count, and implement SELECT-only access control for secure data handling.

2. Objective:

- a) To design and normalize relational tables for real-world entities such as authors, books, departments, and courses.
- b) To implement foreign key relationships for maintaining data integrity across related tables.
- c) To use SQL operations like **INNER JOIN** and **subqueries** to extract meaningful information from related datasets.

To apply basic access control by granting **SELECT-only** privileges to specific users for secure data access.

3. DBMS script and output:

Q1:

```
CREATE TABLE Author (  
    AuthorID INT PRIMARY KEY,  
    AuthorName VARCHAR(100),  
    Country VARCHAR(50)  
);
```



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```
CREATE TABLE Book (  
    BookID INT PRIMARY KEY,  
    Title VARCHAR(100),  
    AuthorID INT,  
    FOREIGN KEY (AuthorID) REFERENCES Author(AuthorID)  
);
```

```
INSERT INTO Author (AuthorID, AuthorName, Country) VALUES  
(1, 'Ayush Ranjan', 'India'),  
(2, 'Haruki Murakami', 'Japan'),  
(3, 'Chinua Achebe', 'Nigeria');
```

```
INSERT INTO Book (BookID, Title, AuthorID) VALUES  
(101, '1984', 1),  
(102, 'Kafka on the Shore', 2),  
(103, 'Things Fall Apart', 3);
```

```
SELECT  
    Book.Title AS BookTitle,  
    Author.AuthorName,  
    Author.Country  
FROM  
    Book  
INNER JOIN  
    Author ON Book.AuthorID = Author.AuthorID;
```

	BookTitle	AuthorName	Country
1	1984	Ayush Ranjan	India
2	Kafka on the Shore	Haruki Murakami	Japan
3	Things Fall Apart	Chinua Achebe	Nigeria



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Q2:

```
CREATE TABLE Department (  
    DeptID INT PRIMARY KEY,  
    DeptName VARCHAR(100)  
);
```

```
CREATE TABLE Course (  
    CourseID INT PRIMARY KEY,  
    CourseName VARCHAR(100),  
    DeptID INT,  
    FOREIGN KEY (DeptID) REFERENCES Department(DeptID)  
);
```

```
INSERT INTO Department (DeptID, DeptName) VALUES  
(1, 'Computer Science'),  
(2, 'Mathematics'),  
(3, 'Physics'),  
(4, 'Chemistry'),  
(5, 'Biology');
```

```
INSERT INTO Course (CourseID, CourseName, DeptID) VALUES  
(101, 'Data Structures', 1),  
(102, 'Operating Systems', 1),  
(103, 'DBMS', 1),  
(104, 'Calculus', 2),  
(105, 'Linear Algebra', 2),  
(106, 'Quantum Mechanics', 3),  
(107, 'Thermodynamics', 3),  
(108, 'Organic Chemistry', 4),  
(109, 'Cell Biology', 5),  
(110, 'Genetics', 5);
```

```
SELECT  
    DeptName,  
    (SELECT COUNT(*)  
     FROM Course  
     WHERE Course.DeptID = Department.DeptID) AS CourseCount  
FROM Department;
```



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```
CREATE LOGIN student_user WITH PASSWORD = 'StrongPassword123!';
```

```
CREATE USER student_user FOR LOGIN student_user;
```

```
GRANT SELECT ON Course TO student_user;
```

	DeptName	CourseCount
1	Computer Science	3
2	Mathematics	2
3	Physics	2
4	Chemistry	1
5	Biology	2

4. Learning Outcomes:

- Understand how to design and implement normalized relational database schemas.
- Learn to apply foreign key constraints to establish relationships between tables.
- Gain hands-on experience with SQL operations such as JOINS and subqueries for data retrieval.
- Develop the ability to manage user access and permissions using SQL access control commands.