



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Experiment 1

Student Name: Archita Srivastava
Branch: CSE
Semester: 5th
Subject Name: ADBMS

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Section/Group: KRG_2B
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1. Aim:

- To design and implement normalized relational database schemas for different realworld scenarios using SQL, establish foreign key relationships, insert relevant data, and retrieve specific information using JOINs and subqueries.

Part A – Easy Level:

- To create tables for AUTHOR1 and BOOKS1, capturing author and book details.
- To implement a foreign key relationship between books and their respective authors.
- To retrieve and display book name, author name, and country using an INNER JOIN.

Part B – Medium Level:

- To create tables for DEPARTMENT and COURSE, maintaining referential integrity.
- To populate the tables with department and course data.
- To use a correlated subquery to count the number of courses per department.
- To filter and display departments offering **more than two** courses.

2. Objective:

- To understand and apply the concepts of relational database design by creating normalized tables with primary and foreign key constraints.
- To insert meaningful real-world data into related tables representing entities such as authors, books, departments, and courses.
- To retrieve and manipulate data using SQL operations like INNER JOIN and correlated subqueries.
- To display relevant information by combining data from multiple tables and applying filtering conditions.
- To strengthen knowledge of referential integrity, data relationships, and query-based data analysis in SQL Server.



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3. ADBMS script and output:

EASY-LEVEL PROBLEM

```
CREATE TABLE AUTHOR_DETAILS(  
    authID INT,  
    authName VARCHAR(100),  
    authCountry VARCHAR(100)  
)
```

```
CREATE TABLE BOOK_DETAILS(  
    bookTitle VARCHAR(100),  
    authID INT  
)
```

```
INSERT INTO AUTHOR_DETAILS(authID, authName, authCountry) VALUES  
(1, 'Mario Puzo', 'USA'),  
(2, 'Shashi Tharoor', 'India'),  
(3, 'J. K. Rowling', 'United Kingdom')
```

```
INSERT INTO BOOK_DETAILS(bookTitle, authID) VALUES  
('The Godfather', 1),  
('The Hindu Way', 2),  
('Harry Potter and the Goblet of Fire', 3),  
('Harry Potter and the Order of the Phoenix', 3)
```



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```
SELECT B.bookTitle AS [Book Title], A.authName AS [Author Name], A.authCountry AS [Author Country]
FROM AUTHOR_DETAILS AS A
INNER JOIN
BOOK_DETAILS AS B
ON
A.authID = B.authID
```

MEDIUM LEVEL PROBLEM:

```
CREATE TABLE Departments (
dept_id INT PRIMARY KEY,
dept_name VARCHAR(100) NOT NULL
);
```

```
CREATE TABLE Courses (
course_id INT PRIMARY KEY,
course_name VARCHAR(100) NOT NULL,
dept_id INT,
FOREIGN KEY (dept_id) REFERENCES Departments(dept_id)
);
```

```
INSERT INTO Departments (dept_id, dept_name) VALUES
(1, 'Computer Science'),
(2, 'Mathematics'),
```



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```
(3, 'Physics'),  
(4, 'Biology'),  
(5, 'English');
```

```
INSERT INTO Courses (course_id, course_name, dept_id) VALUES  
(101, 'Data Structures', 1),  
(102, 'Algorithms', 1),  
(103, 'Operating Systems', 1),  
(104, 'Linear Algebra', 2),  
(105, 'Calculus', 2),  
(106, 'Quantum Mechanics', 3),  
(107, 'Classical Mechanics', 3),  
(108, 'Genetics', 4),  
(109, 'English Language', 5),  
(110, 'English Literature', 5);
```

```
SELECT dept_name  
FROM Departments  
WHERE dept_id IN (  
    SELECT dept_id  
    FROM Courses  
    GROUP BY dept_id  
    HAVING COUNT(*) > 2  
);
```



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GRANT SELECT ON Courses TO readonly_user;

OUTPUTS:

Book Title	Author Name	Author Country
The Godfather	Mario Puzo	USA
The Hindu Way	Shashi Tharoor	India
Harry Potter and the Goblet of Fire	by J. K. Rowling	United Kingdom
Harry Potter and the Order of the Phoenix	by J. K. Rowling	United Kingdom

Figure 1: Easy level Problem

DEPT_NAME
Computer Science

Figure 2: Medium level Problem