



DEPARTMENT OF COMPUTER *Discover. Learn. Empower.* SCIENCE & ENGINEERING

Experiment 3

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Subject Code: 23CSP-333

1. Aim: To understand and implement sub-queries (scalar, multi-valued, and correlated) in SQL for retrieving complex results from multiple conditions.

2. Objective:

- To create and insert records into the MyEmployees table.
- To practice scalar sub-queries (returning a single value) for comparisons.
- To practice multi-valued sub-queries using operators like IN.
- To apply sub-queries with aggregate functions (MAX, COUNT, etc.).
- To understand the use of sub-queries inside WHERE and HAVING clauses.

3. DBMS Script:

-- Create table MyEmployees

```
CREATE TABLE MyEmployees (  
    EmpId INT PRIMARY KEY IDENTITY(1,1),  
    EmpName VARCHAR(50),  
    Gender VARCHAR(10),  
    Salary INT,  
    City VARCHAR(50),  
    Dept_id INT  
);
```

-- Insert records

```
INSERT INTO MyEmployees (EmpName, Gender, Salary, City, Dept_id)
```

```
VALUES
```

```
('Amit', 'Male', 50000, 'Delhi', 2),
```

```
('Priya', 'Female', 60000, 'Mumbai', 1),
```

```
('Rajesh', 'Male', 45000, 'Agra', 3),
```

```
('Sneha', 'Female', 55000, 'Delhi', 4),
```

```
('Anil', 'Male', 52000, 'Agra', 2),
```

```
('Sunita', 'Female', 48000, 'Mumbai', 1),
```

```
('Vijay', 'Male', 47000, 'Agra', 3),
```

```
('Ritu', 'Female', 62000, 'Mumbai', 2),
```

```
('Alok', 'Male', 51000, 'Delhi', 1),
```

```
('Neha', 'Female', 53000, 'Agra', 4),
```

```
('Simran', 'Female', 33000, 'Agra', 3);
```

-- Second highest salary

```
SELECT MAX(Salary) AS SecondHighestSalary
```

```
FROM MyEmployees
```

```
WHERE Salary < (SELECT MAX(Salary) FROM MyEmployees);
```

-- Scalar subquery example

-- (Assumes you already have a 'dept' table created with columns id, dept_name)

```
SELECT * FROM MyEmployees
```

```
WHERE Dept_id <> (SELECT id FROM dept WHERE dept_name = 'Accounts');
```

-- Multi-valued subquery

```
SELECT * FROM MyEmployees
```

```
WHERE EmpName IN (  
    SELECT EmpName FROM MyEmployees WHERE Gender = 'Female'  
);
```

-- Employee table example

```
CREATE TABLE employee (  
    id INT  
);
```

```
INSERT INTO employee VALUES (2), (4), (4), (6), (6), (7), (8), (8);
```

-- Largest unique employee ID (SQL Server style, no LIMIT)

```
SELECT TOP 1 id  
FROM employee  
GROUP BY id  
HAVING COUNT(id) = 1  
ORDER BY id DESC;
```



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4. Output:

```
Sambhav Mahajan@Sambhav MINGW64 ~/Documents/DBMS
$ ./run.bat
60000
Parse error near line 230: no such table: dept
2|Priya|Female|60000|Mumbai|1
4|Sneha|Female|55000|Delhi|4
6|Sunita|Female|48000|Mumbai|1
8|Ritu|Female|62000|Mumbai|2
10|Neha|Female|53000|Agra|4
11|Simran|Female|33000|Agra|3
7
Press any key to continue . . .
```

5. Learning Outcomes:

- Differentiate between **scalar sub-queries** and **multi-valued sub-queries**.
- Use **sub-queries with aggregate functions** like MAX, COUNT.
- Implement **nested queries** in WHERE and HAVING clauses.
- Retrieve results that are not directly available from a single query.
- Understand how **sub-queries help break down complex problems** into manageable steps.