Experiment 2

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Subject Name: ADBMS **Subject Code: 23CSP-333**

1. **Aim**: To demonstrate the use of self-joins and conditional joins in SQL for managing hierarchical employee relationships and performing conditional lookups using LEFT JOIN and IFNULL across two related tables**.**
   a. Employee-Manager Hierarchy Using Self-Join
   b. Conditional Join Between Financial Tables
2. **Objective:**

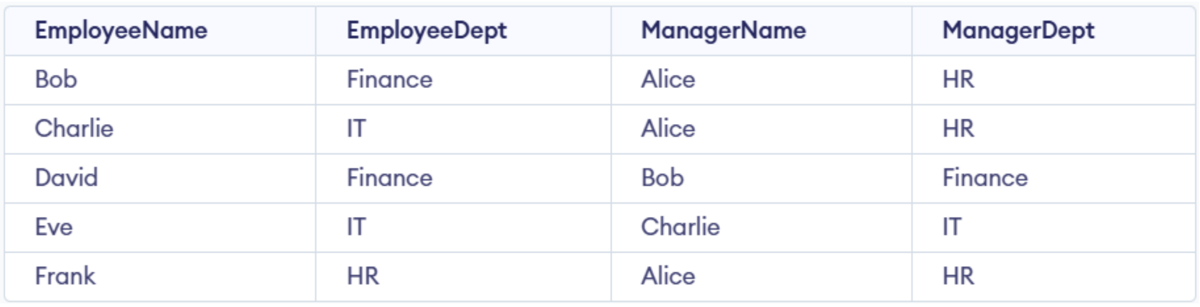
   The objective of this SQL code is to develop a practical understanding of intermediate relational database concepts through two realistic scenarios. The first part demonstrates employee-management relationships using a self-join on a single table, showing how hierarchical data can be modeled and queried effectively. The second part showcases conditional data retrieval using LEFT JOIN and IFNULL to extract NPV values from time-based financial records, even when some data is missing. Together, these examples emphasize efficient data modeling, referential integrity, and robust querying practices.

3. **DBMS script and output:**

Solution-(a)

```
-- Medium Level Problem
CREATE TABLE Employee (
   EmpID INTEGER PRIMARY KEY,
   EmpName TEXT NOT NULL,
   Department TEXT NOT NULL,
   ManagerID INTEGER,
   FOREIGN KEY (ManagerID) REFERENCES Employee(EmpID)
);

INSERT INTO Employee (EmpID, EmpName, Department, ManagerID)
VALUES
(1, 'Alice', 'HR', NULL),
(2, 'Bob', 'Finance', 1),
(3, 'Charlie', 'IT', 1),
(4, 'David', 'Finance', 2),
(5, 'Eve', 'IT', 3),
(6, 'Frank', 'HR', 1);

SELECT
   E.EmpName AS EmployeeName,
   E.Department AS EmployeeDept,
   M.EmpName AS ManagerName,
   M.Department AS ManagerDept
FROM
```

```
Employee E
JOIN
    Employee M
ON
   E.ManagerID = M.EmpID;
```

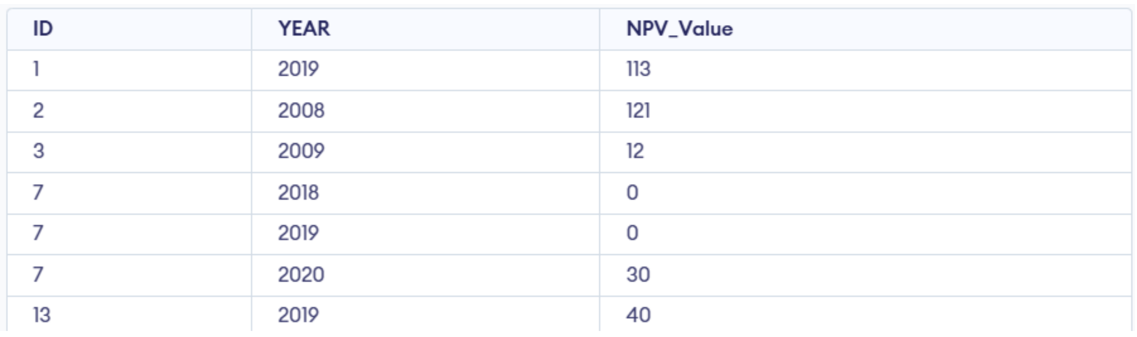


EmployeeName	EmployeeDept	ManagerName	ManagerDept
Bob	Finance	Alice	HR
Charlie	IT	Alice	HR
David	Finance	Bob	Finance
Eve	IT	Charlie	IT
Frank	HR	Alice	HR

Solution-(b)

```
-- Hard Level Problem
    CREATE TABLE TBL_YEAR (
        ID INT,
        YEAR INT,
        NPV INT
    );

    CREATE TABLE TBL_QUERY (
        ID INT,
        YEAR INT
    );

    INSERT INTO TBL_YEAR (ID, YEAR, NPV)
    VALUES
    (1, 2018, 100),
    (7, 2020, 30),
    (13, 2019, 40),
    (1, 2019, 113),
    (2, 2008, 121),
    (3, 2009, 12),
    (11, 2020, 99),
    (7, 2019, 0);

    INSERT INTO TBL_QUERY (ID, YEAR)
    VALUES
    (1, 2019),
    (2, 2008),
    (3, 2009),
    (7, 2018),
    (7, 2019),
    (7, 2020),
    (13, 2019);

    SELECT
        q.ID,
        q.YEAR,
        IFNULL(y.NPV, 0) AS NPV_Value
```

```
FROM
   TBL_QUERY q
LEFT JOIN
   TBL_YEAR y
ON
   q.ID = y.ID AND q.YEAR = y.YEAR;
```



ID	YEAR	NPV_Value
1	2019	113
2	2008	121
3	2009	12
7	2018	0
7	2019	0
7	2020	30
13	2019	40

4. Learning Outcomes (What I have Learnt):

- To demonstrate the use of **self-joins** in handling hierarchical relationships like employee–manager mappings within a single table.
- To understand how to define **foreign key constraints** to maintain referential integrity between entities.
- To use **LEFT JOINs with NULL handling (IFNULL)** for matching records across related datasets and managing missing data gracefully.
- To apply **real-world data modeling** scenarios, such as employee reporting structure and year-wise data lookups.
- To enhance proficiency in **querying and combining data** from multiple tables using conditional logic and joins.