Experiment 2

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1. Problem Statement & SQL Code:

Q1) Organizational Hierarchy Explorer

You are a Database Engineer at TalentTree Inc., an enterprise HR analytics platform that stores employee data, including their reporting relationships. The company maintains a centralized Employee relation that holds:
Each employee's ID, name, department, and manager ID (who is also an employee in the same table).
Your task is to generate a report that maps employees to their respective managers, showing:
The employee's name and department
Their manager's name and department (if applicable)
This will help the HR department visualize the internal reporting hierarchy.

Solution:

```
CREATE TABLE Employee (
   EmpID INT PRIMARY KEY,
   Ename VARCHAR(100),
   Department VARCHAR(50),
   ManagerId INT
   FOREIGN KEY (ManagerId) REFERENCES Employee(EmpID)
);
```

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

SELECT E1.Ename AS [EmployeeName], E2.Ename AS [ManagerName],
E1.Department AS [Employee_Dept], E2.DEPT AS [ManagerDept]
FROM
Employee AS E1
LEFT OUTER JOIN
Employee AS E2
ON
E1.ManagerId = E2.EmpID
```

OUTPUT:

	EMPLOYEENAME	EMPLOYEE_DEPT	MANAGERNAME	MANAGERDEPT
1	Bob	Finance	Alice	HR
2	Charlie	IT	Alice	HR
3	David	Finance	Bob	Finance
4	Frank	HR	Bob	Finance
5	Eve	IT	Charlie	IT
6	Alice	HR	*(null)*	*(null)*

Q2) Financial Forecast Matching with Fallback Strategy

You are a Data Engineer at FinSight Corp, a company that models Net Present Value (NPV) projections for investment decisions. Your system maintains two key datasets:
Year_tbl: Actual recorded NPV's of various financial instruments over different years:

ID: Unique Financial instrument identifier.
YEAR: Year of record
NPV: Net Present Value in that year

Queries_tbl: A list of instrument-year pairs for which stakeholders are requesting NPV values:

ID: Financial instrument identifier
YEAR: Year of interest.

Find the NPV of each query from the Queries table. Return the output order by ID and Year in the sorted form.
However, not all ID-YEAR combinations in the Queries table are present in the Year_tbl. If an NPV is missing for a requested combination, assume it to be 0 to maintain a consistent financial report.

Solution:

```
CREATE TABLE Year_tbl (
   ID INT,
   YEAR INT,
   NPV INT
);

CREATE TABLE Queries (
   ID INT,
   YEAR INT
);
```

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

SELECT Q.ID, Q.YEAR,isnull(Y.NPV,0 )
from Queries as Q
left outer join
Year_tbl as Y
on
Q.ID=Y.ID and Q.YEAR=Y.YEAR
```

OUTPUT:

ID	YEAR	NVL(Y.NPV,0)
7	2020	30
13	2019	40
1	2019	113
2	2008	121
3	2009	12
7	2019	0
7	2018	0