Experiment 2

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1. AIM:

A. Organizational Hierarchy Explorer (Medium)

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.

B. Financial Forecast Matching with Fallback Strategy (Hard)

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:

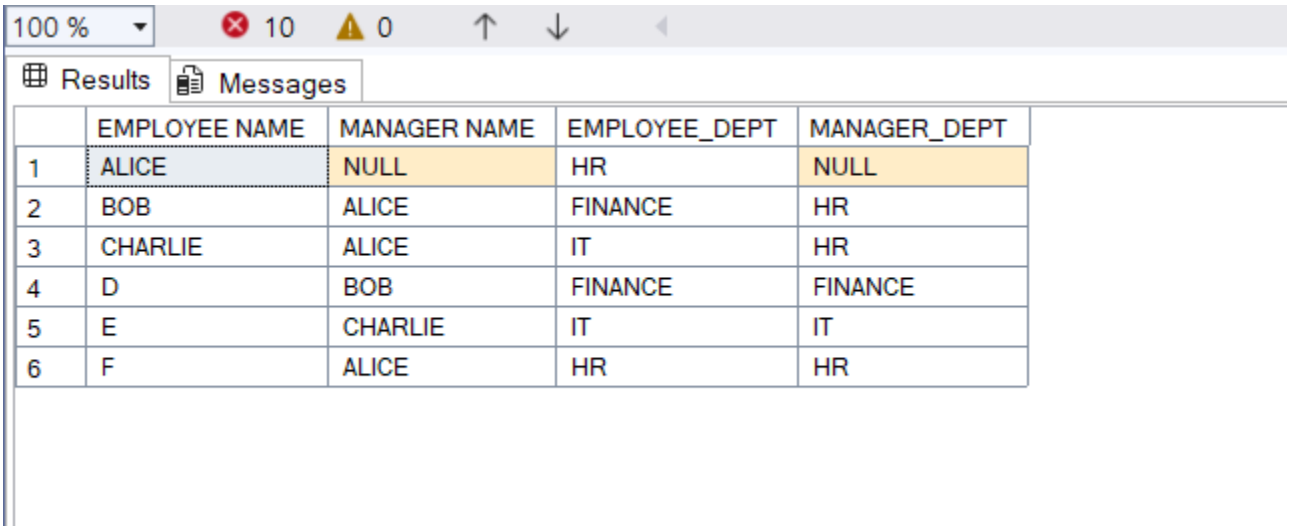
1. Year_tbl: Actual recorded NPV's of various financial instruments over different years: ID: Unique Financial instrument identifier. YEAR: Year of record NPV: Net Present Value in that year
2. Queries_tbl: A list of instrument-year pairs for which stakeholders are requesting NPV values: ID: Financial 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.

2. DBMS CODE:

Solution A:

```
CREATE TABLE EMPLOYEE(
EMPID INT,
ENAME VARCHAR(20),
DEPARTMENT VARCHAR(20),
MANAGERID INT
);

INSERT INTO EMPLOYEE
VALUES
(1, 'ALICE', 'HR', NULL),
(2, 'BOB', 'FINANCE', 1),
(3, 'CHARLIE', 'IT', 1),
(4, 'D', 'FINANCE', 2),
(5, 'E', 'IT', 3),
(6, 'F', 'HR', 1);

SELECT E1.ENAME AS [EMPLOYEE NAME], E2.ENAME AS [MANAGER NAME],
                                                    E1.DEPARTMENT AS
[EMPLOYEE_DEPT], E2.DEPARTMENT AS [MANAGER_DEPT]
FROM EMPLOYEE AS E1
LEFT OUTER JOIN
EMPLOYEE AS E2
ON E1.MANAGERID = E2.EMPID;
```

Output:

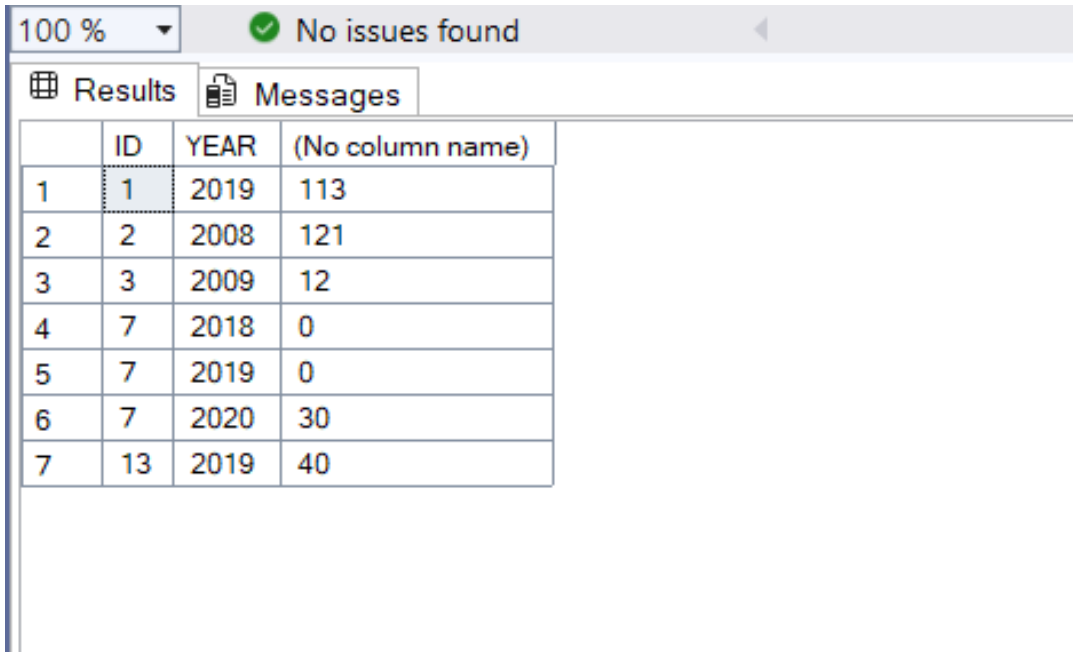


	EMPLOYEE NAME	MANAGER NAME	EMPLOYEE_DEPT	MANAGER_DEPT
1	ALICE	NULL	HR	NULL
2	BOB	ALICE	FINANCE	HR
3	CHARLIE	ALICE	IT	HR
4	D	BOB	FINANCE	FINANCE
5	E	CHARLIE	IT	IT
6	F	ALICE	HR	HR

Solution B:

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

CREATE TABLE Queries (
   ID INT,
   YEAR INT
);

-- Insert data into Year_tbl
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 data into Queries
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	(No column name)
1	1	2019	113
2	2	2008	121
3	3	2009	12
4	7	2018	0
5	7	2019	0
6	7	2020	30
7	13	2019	40