EXPERIMENT-2

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Subject Name: ADBMS
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1. Aim:

--- Medium Level Problem ---

a) **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.

Input Table: Employee

EmpID	Ename	Department	ManagerID
1	Alice	HR	NULL
2	Bob	Finance	1
3	Charlie	IT	1
4	David	Finance	2
5	Eve	IT	3
6	Frank	HR	1

--- Hard Level Problem ---

b) **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:

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.

Year_tbl

ID	YEAR	NPV
1	2018	100
7	2020	30
13	2019	40
1	2019	113
2	2008	121
3	2009	12
11	2020	99
7	2019	0

Queries_tbl

ID	YEAR
1	2019
2	2008
3	2009
7	2018
7	2019
7	2020
13	2019

2. Platform Used:

Microsoft SQL Server Management Studio

3. SQL Code:

a)

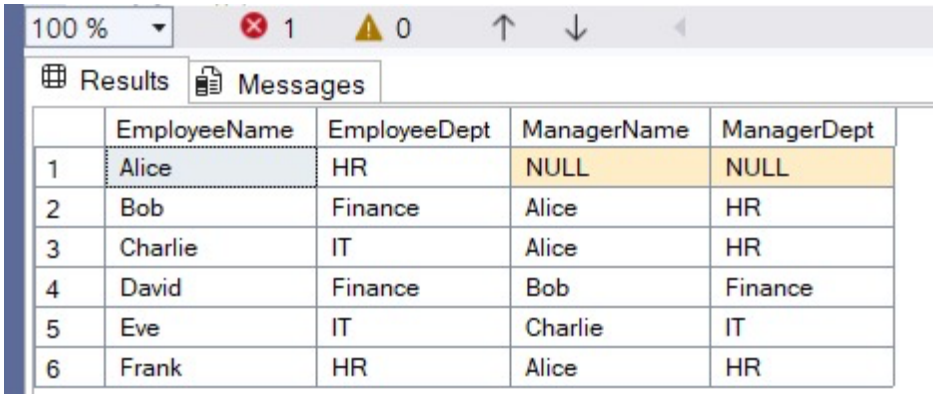
```
CREATE TABLE Employee (
    EmpID INT PRIMARY KEY,
    Ename VARCHAR(50) NOT NULL,
    Department VARCHAR(50) NOT NULL,
    ManagerID INT NULL
);

INSERT INTO Employee (EmpID, Ename, 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);

ALTER TABLE Employee
ADD CONSTRAINT FK_Employee FOREIGN KEY (ManagerID)
REFERENCES Employee(EmpID);

SELECT
    E1.Ename AS EmployeeName,
    E1.Department AS EmployeeDept,
    E2.Ename AS [ManagerName],
    E2.Department AS ManagerDept
FROM
    Employee AS E1
LEFT JOIN
    Employee AS E2
ON
    E1.ManagerID = E2.EmpID;
```

b)
```
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) AS NPV
FROM
   Queries AS Q
```

```
LEFT JOIN
   Year_tbl AS Y
ON
   Q.ID = Y.ID AND Q.YEAR = Y.YEAR
ORDER BY
   Q.ID, Q.YEAR;
```

4. Output:

a)

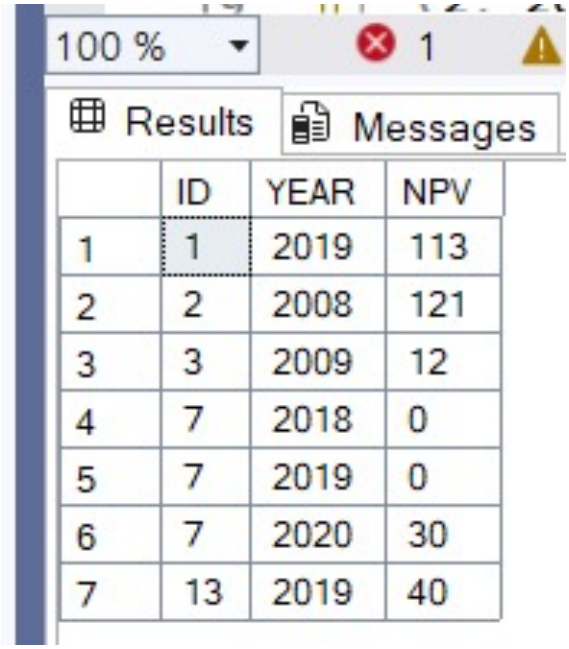


100 % 1 0

Results Messages

	EmployeeName	EmployeeDept	ManagerName	ManagerDept
1	Alice	HR	NULL	NULL
2	Bob	Finance	Alice	HR
3	Charlie	IT	Alice	HR
4	David	Finance	Bob	Finance
5	Eve	IT	Charlie	IT
6	Frank	HR	Alice	HR

b)



100 % 1

Results Messages

	ID	YEAR	NPV
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