



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Discover. Learn. Empower.

Experiment-2

Student Name: Manjot Singh

Branch: CSE

Semester: 5th

Subject Name: ADBMS

UID: 23BCS12549

Section/Group: KRG-2B

Date of Performance: 28/07/25

Subject Code: 23CSP-333

1. Aim:

Organizational Hierarchy Explorer (Medium)

This problem focuses on generating an organizational report using SQL joins to visualize employee reporting relationships within a single table.

- 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.

Financial Forecast Matching with Fallback Strategy (Hard)

This problem involves advanced data retrieval and manipulation, focusing on joining datasets and implementing a fallback strategy for missing data.

- 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.



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Discover. Learn. Empower.

2. Objective:

- Understand self-joins in SQL.
- Practice joining a table to itself.
- Extract specific columns from joined tables.
- Handle NULL values in join conditions.
- Perform outer joins to combine datasets.
- Implement conditional logic for missing data.
- Order query results based on multiple columns.
- Handle data imputation for consistent reporting.

3. DBMS Script :

Script 1:

```
USE KRG_2B;
```

```
CREATE TABLE Employee (  
    EmpID INT PRIMARY KEY,  
    Ename VARCHAR(100),  
    Department VARCHAR(100),  
    ManagerID INT  
);
```

```
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);
```

```
SELECT E.Ename AS EmployeeName, E.Department AS EmployeeDept, M.Ename AS  
ManagerName, M.Department AS ManagerDept  
FROM Employee E  
LEFT JOIN Employee M ON E.ManagerID = M.EmpID;
```

Script 2:

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

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

```
INSERT INTO Year_tbl (ID, YEAR, NPV) VALUES  
(1, 2018, 100),
```



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Discover. Learn. Empower.

```
(7, 2020, 30),  
(13, 2019, 40),  
(1, 2019, 113),  
(2, 2008, 121),  
(3, 2009, 12),  
(11, 2020, 99),  
(7, 2019, 0);
```

```
INSERT INTO Queries_tbl (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_tbl Q  
LEFT JOIN Year_tbl Y ON Q.ID = Y.ID AND Q.YEAR = Y.YEAR  
ORDER BY Q.ID, Q.YEAR;
```

4. Output:

Output 1:

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

Output 2:

	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

5. Learning Outcomes:

- Successfully performed self-joins on tables.
- Mapped hierarchical data within a single table.
- Handled NULLs gracefully in join operations.
- Generated reports for organizational structures.