Worksheet 2

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1. Aim:

A). Author-Book Relationship Using Joins and Basic SQL Operations
B). Department-Course Subquery and Access Control

2. Objective:

A)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) Advanced

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.

DBMS script

A)

```
--MEDIUM LEVEL PROBLEM
CREATE TABLE Employee(
        EmpID int,
        Ename varchar(100),
        Department varchar(100),
        ManagerID int
)


INSERT INTO Employee 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
 E1.Ename AS [Employee Name],
E2.Ename AS [Manager Name],
E1.Department AS [Employee Department],
E2.Department AS [Manager Department]
FROM Employee AS E1
LEFT OUTER JOIN
Employee AS E2
ON
E1.ManagerID = E2.EmpID
```

B)
```
-- HARD LEVEL PROBLEM
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;
```

4.Output:

A)

	Employee Name	Manager Name	Employee Department	Manager Department
1	Alice	NULL	HR	NULL
2	Bob	Alice	Finance	HR
3	Charlie	Alice	IT	HR
4	David	Bob	Finance	Finance
5	Eve	Charlie	IT	IT
6	Frank	Alice	HR	HR

B)

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