University Institute of Engineering

Department of Computer Science & Engineering

EXPERIMENT - 1

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BRANCH : BE-CSE   **SECTION/GROUP** : KRG_2A

SEMESTER : 5ᵗʰ   **SUBJECT CODE** : 23CSP-339

1. Aim Of The Practical :

(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.

(HARD)

To write SQL queries that retrieve requested Net Present Value (NPV) data by performing conditional joins on multiple columns (II) and YEAR) across two related tables, and to handle missing data using appropriate SQL functions.

2. Tools Used : SQL Server Management Studio

3. Code

(Medium)

```sql
CREATE TABLE Employee(
EMP_ID INT PRIMARY KEY,
EMP_NAME VARCHAR(25),
DEPARTMENT VARCHAR(25),
MANAGER_ID INT);

INSERT INTO Employee
(EMP_ID,EMP_NAME,DEPARTMENT,MANAGER_ID) VALUES
(1, 'Akash', 'hr', NULL),
(2, 'Lakshay', 'finance', 1),
(3, 'Prakash', 'it', 1),
(4, 'Abhinav', 'finance', 2),
(5, 'Sameer', 'it', 3),
(6, 'Aadarsh', 'hr', 1);

SELECT * FROM Employee;

SELECT E1.EMP_NAME AS [EMPLOYEE NAME],
E2.EMP_NAME 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.MANAGER_ID = E2.EMP_ID;
```

(HARD)

```sql
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);

SELECT * FROM Year_tbl;

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

SELECT * FROM Queries;

SELECT
  Q.ID,
  Q.YEAR,
  ISNULL(Y.NPV, 0) AS NPV
FROM
  Queries AS Q
LEFT OUTER JOIN
  Year_tbl AS Y
ON
  Q.ID = Y.ID AND Q.YEAR = Y.YEAR;
```

4. Output

(Medium)

	EMP_ID	EMP_NAME	DEPARTMENT	MANAGER_ID
1	1	Akash	hr	NULL
2	2	Lakshay	finance	1
3	3	Prakash	it	1
4	4	Abhinav	finance	2
5	5	Sameer	it	3
6	6	Aadarsh	hr	1

	EMPLOYEE NAME	MANAGER NAME	EMPLOYEE_DEPT	MANAGER_DEPT
1	Akash	NULL	hr	NULL
2	Lakshay	Akash	finance	hr
3	Prakash	Akash	it	hr
4	Abhinav	Lakshay	finance	finance
5	Sameer	Prakash	it	it
6	Aadarsh	Akash	hr	hr

(HARD)

	ID	YEAR	NPV
1	1	2018	100
2	7	2020	30
3	13	2019	40
4	1	2019	113
5	2	2008	121
6	3	2009	12
7	11	2020	99
8	7	2019	0

	ID	YEAR
1	1	2019
2	2	2008
3	3	2009
4	7	2018
5	7	2019
6	7	2020
7	13	2019

	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 :

- Understand and implement self-joins to model hierarchical relationships within a single table (e.g., employees reporting to other employees).

- Construct relational queries to fetch meaningful information such as employee-manager relationships, including handling NULL values using LEFT JOIN.

- Design and populate tables using the CREATE TABLE and INSERT INTO statements for real-world hierarchical and time-series data scenarios.

- Perform multi-table joins to retrieve and match data across different datasets, such as actual vs. requested values (e.g., NPV values for specific years).

- Handle missing data using functions like ISNULL() to substitute default values during join operations.

- Apply conditional joins involving multiple keys (e.g., joining on both ID and YEAR) to ensure accurate data mapping.

- Develop problem-solving approaches using SQL to derive insights from HR records and financial datasets in enterprise applications.