

Experiment 2

Student Name: Harsh Kumar UID: 23BCS11889

Branch: CSE
Semester: 5th
Subject Name: ADBMS
Semester: 5th
Subject Code: 23CSP-333

1. Aim:

- To design and implement normalized relational database schemas using SQL for employee-manager and financial data scenarios.
- To establish self-referencing and standard foreign key relationships between tables.
- To retrieve specific data using JOIN operations and handle missing values using functions like ISNULL().

❖ Part A− Medium Level:

- To create a table Employee_tbl to capture employee details along with their reporting manager.
- To implement a self-join on Employee tbl to display employee and their manager details.
- To use a LEFT OUTER JOIN to ensure employees without a manager (i.e., top-level managers) are also included in the result.
- To retrieve and display employee name, manager name, and their respective departments.

❖ Part B – Hard Level:

- To create two tables Year_tbl and Queries for tracking financial Net Present Value (NPV) by year and ID.
- To insert multiple year-wise NPV values for various IDs.
- To query specific combinations of ID and year using a LEFT JOIN.
- To handle missing NPV values using the ISNULL() function, ensuring zero is shown when no record exists.

2. Objective:

- To understand and apply self-joins in SQL to relate rows within the same table, such as employee-manager relationships.
- To design and populate relational tables for temporal financial data, enabling timeseries queries.
- To retrieve data using outer joins and display comprehensive information, including unmatched rows.

- To utilize SQL functions like ISNULL() for handling NULL values in results.
- To enhance skills in data modeling, joining strategies, and conditional data retrieval in SQL Server.

3. ADBMS script and output:

MEDIUM-LEVEL PROBLEM

```
CREATE TABLE Employee_tbl (
  EmpID INT,
  EmpName VARCHAR(100),
  Dept VARCHAR(100),
  Manager_ID INT
);
INSERT INTO Employee_tbl 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.EmpName AS [EMPLOYEE NAME],
  E2.EmpName AS [MANAGER NAME],
  E1.Dept AS [EMPLOYEE DEPARTMENT],
```

```
E2.Dept AS [MANAGER DEPARTMENT]
FROM
  Employee_tbl AS E1
LEFT OUTER JOIN
  Employee_tbl AS E2
ON
  E1.Manager_ID = E2.EmpID;
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;

OUTPUTS:

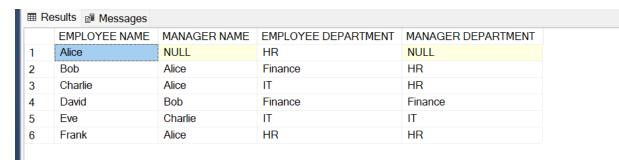


Figure 1: Medium Level Problem

⊞ 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

Figure 2: Hard level Problem