University Institute of Engineering

Department of Computer Science & Engineering

EXPERIMENT: 2

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SECTION : KRG_2A **SEMESTER**: 5TH

SUBJECT CODE: 23CSP-339 **SUBJECT** : ADBMS

I. Aim Of The Practical :

[MEDIUM] **Organizational Hierarchy Explorer**

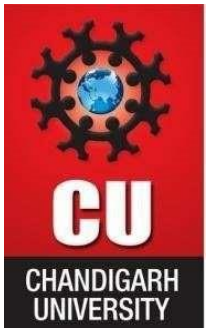
You are a Database Engineer at TalentTree Inc., an enterprise HR analytics platform that stores employee data, including their reporting relationships. The company maintains a centralized Employee relation that holds:
Each employee's ID, name, department, and manager ID (who is also an employee in the 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.

[HARD] **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.



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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.

II. Tools Used: SQL Server Management Studio

III. Code:

```
----------------.MEDIUM: Organizational Hierarchy Explorer
create database db2
create table emp_tbl(empid int primary key, emp_name varchar(max),
department char(10), manager_id int)
insert into emp_tbl
values
   (1,'Alice','HR',NULL),
   (2,'Bob','Finance',1),
   (3,'Chotu','I.T.',1),
   (4,'Dhokad','Finance',2),
   (5,'Ennu','IT',3),
   (6,'Fulli','HR',1);

alter table emp_tbl
add constraint fk_emp foreign key(manager_id)
references emp_tbl(empid)

select * from emp_tbl

select e.emp_name as employee_name, e.department as employee_dept,
f.emp_name as manager_name, f.department as manager_dept
from emp_tbl as e
left outer join
emp_tbl as f
on
e.manager_id=f.empid


------------------HARD: Financial Forecast Matching with Fallback

create table year_tbl(id int , year int, npv 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);

create table quer_tbl(qid int , year int)
insert into quer_tbl
values
    (1,2019),
    (2,2008),
    (3,2009),
    (7,2018),
    (7,2019),
    (7,2020),
    (13,2019);

select * from year_tbl
select * from quer_tbl

select y.id, y.year, isnull(y.npv,0)
from year_tbl as y
inner join
quer_tbl as q
on
y.id=q.qid
and
y.year=q.year
order by y.id
```

Output :

[MEDIUM]

Tables:

	empid	emp_name	department	manager_id
1	1	Alice	HR	NULL
2	2	Bob	Finance	1
3	3	Chotu	I.T.	1
4	4	Dhokad	Finance	2
5	5	Ennu	IT	3
6	6	Fulli	HR	1

.....Employee table

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Final:

	employee_name	employee_dept	manager_name	manager_dept
1	Alice	HR	NULL	NULL
2	Bob	Finance	Alice	HR
3	Chotu	I.T.	Alice	HR
4	Dhokad	Finance	Bob	Finance
5	Ennu	IT	Chotu	I.T.
6	Fulli	HR	Alice	HR

[HARD]

Tables:

	id	year	npv
1	1	2018	100
2	7	2020	30
3	1...	2019	40
4	1	2019	113
5	2	2008	121
6	3	2009	12
7	1...	2020	99
8	7	2019	0

……Year's table

	qid	year
1	1	2019
2	2	2008
3	3	2009
4	7	2018
5	7	2019
6	7	2020
7	13	2019

……Queries table

Final:

	id	year	(No column name)
1	1	2019	113
2	2	2008	121
3	3	2009	12
4	7	2019	0
5	7	2020	30
6	1...	2019	40

……NPV table

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IV. Learning Outcomes :

➢ Organizational Hierarchy Explorer

- I learned how to model organizational relationships using a self-referencing foreign key (manager_id) within a single employee table.
- I practiced creating a normalized schema with constraints like PRIMARY KEY and FOREIGN KEY to ensure data integrity.
- By inserting sample employee data across departments, I saw how hierarchical structures can be embedded and queried effectively.
- I used a LEFT OUTER JOIN to retrieve employee-manager relationships, including cases where the manager is null, which helped me understand optional relationships in data.
- This exercise gave me practical insight into how self-joins can be used to explore internal structures like org charts and reporting lines.

➢ Financial Forecast Matching with Fallback

- I created and populated two tables to simulate financial forecasting across multiple years and entities.
- I used INNER JOIN to match forecast data (npv) with query conditions based on both id and year, reinforcing the importance of multi-key joins.
- I applied ISNULL() to handle missing values gracefully, ensuring that null npv entries were replaced with 0 to maintain analytical consistency.
- This taught me how to build resilient queries that account for incomplete data while still delivering meaningful results.
- I also practiced ordering results for clarity, which is especially useful when preparing financial reports or dashboards.