

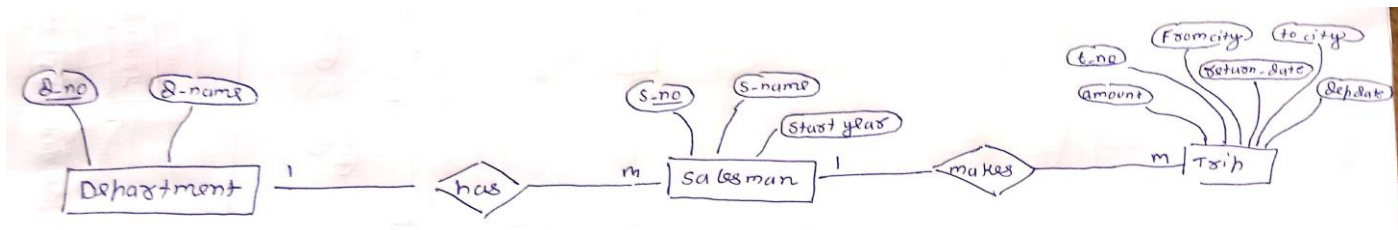
Q.1) Practical Questions on PostgreSQL Consider the following database

Salesman (sno, s_name, start_year)

Trip (tno, from_city, to_city, departure_date, return_date, amount)

Dept (deptno, dept_name)
The relationship is as follows. Dept-salesman 1 To M Salesman-Trip 1 To M

a) Draw the ER diagram for above relational schema and normalize it in 3NF.



b) Create the above database in 3NF form in PostgreSQL using constraints.

```
CREATE TABLE Dept (deptno SERIAL PRIMARY KEY, dept_name VARCHAR(50) NOT NULL UNIQUE);
```

```
CREATE TABLE Salesman (sno SERIAL PRIMARY KEY, s_name VARCHAR(50) NOT NULL, start_year  
INTEGER NOT NULL, deptno INTEGER REFERENCES Dept(deptno) NOT NULL, experience INTEGER AS  
(EXTRACT(YEAR FROM CURRENT_DATE) - start_year) STORED);
```

```
CREATE TABLE Trip (tno SERIAL PRIMARY KEY, from_city VARCHAR(50) NOT NULL, to_city  
VARCHAR(50) NOT NULL, departure_date DATE NOT NULL, return_date DATE NOT NULL, amount  
DECIMAL(10,2) NOT NULL, sno INTEGER REFERENCES Salesman(sno) NOT NULL);
```

```
INSERT INTO Dept (dept_name) VALUES ('Marketing'), ('Sales'), ('Engineering');
```

```
INSERT INTO Salesman (s_name, start_year, deptno) VALUES ('Mr. Patil',  
2015, 1), ('Ms. Sharma', 2018, 2), ('Mr. Khan', 2020, 3);
```

```
INSERT INTO Trip (from_city, to_city, departure_date, return_date, amount, sno) VALUES ('Mumbai', 'Delhi',  
'2024-04-01', '2024-04-05', 75000.00, 1), ('Chennai', 'Kolkata', '2024-03-15', '2024-03-20', 50000.00, 2), ('Bangalore',  
'Hyderabad', '2024-02-10', '2024-02-14', 80000.00, 3), ('Pune', 'Jaipur', '2024-01-20', '2024-01-25', 60000.00, 1);
```

Q2.) Using above database, solve the following queries:

a) List salesman details whose department name is 'Marketing'

```
SELECT s.sno, s.s_name, s.start_year, s.experience FROM Salesman s INNER JOIN Dept d ON s.deptno = d.deptno  
WHERE d.dept_name = 'Marketing';
```

b) Find trip details along with salesman whose experience is maximum.

```
SELECT t.*, s.* FROM Trip t INNER JOIN Salesman s ON t.sno = s.sno WHERE s.experience = (SELECT  
MAX(experience) FROM Salesman);
```

c) Alter table salesman to add attribute 'experience'.

d) Find the departments from which the salesman has done number of trips more than two.

```
SELECT d.dept_name FROM Dept d INNER JOIN Salesman s ON s.deptno = d.deptno GROUP BY d.deptno,  
d.dept_name HAVING COUNT(DISTINCT tno) > 2;
```