Database Management System Lab

Code: PMDS506P

Digital Assignment 3

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Course: M.Sc in Data Science

Q1. Create the following tables and answer the following questions.

1. **Retrieve all customers and their corresponding salesmen's names using an inner join.**

   SELECT C.CUST_NAME AS CUSTOMER, S.NAME AS SALESMAN FROM CUSTOMERS C INNER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID;

```
SQL> select c.cust_name as customer, s.name as salesman from customers c inner join salesman s on c.sale
sman_id = s.salesman_id;

CUSTOMER             SALESMAN
-------------------- --------------------
Nick Rimando         James Hoog
Brad Davis           James Hoog
Graham Zusi          Nail Knite
Julian Green         Nail Knite
Fabian Johnson       Mc Lyon
Geoff Cameron        Lauson Hen
Jozy Altidor         Paul Adam
Brad Guzan           Pit Alex

8 rows selected.

SQL>
```

2. **Find all customers and their respective salesmen where the customer's city is the same as the salesman's city.**

   SELECT C.CUST_NAME AS CUSTOMER, S.NAME AS SALESMAN FROM CUSTOMERS C INNER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID WHERE C.CITY = S.CITY;

```
SQL> select c.cust_name as customer, s.name as salesman from customers c inner join salesman s on c.sale
sman_id = s.salesman_id where c.city = s.city;

CUSTOMER             SALESMAN
-------------------- --------------------
Nick Rimando         James Hoog
Brad Davis           James Hoog
Fabian Johnson       Mc Lyon
Brad Guzan           Pit Alex

SQL> SP2-0042: unknown command "s" - rest of line ignored.
SQL>
```

3. **Show all customers along with their salesmen's details who have a grade higher than 200.**

   SELECT C.CUST_NAME AS CUSTOMER, S.NAME AS SALESMAN FROM CUSTOMERS C INNER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID WHERE C.GRADE >200;

```
SQL> select c.cust_name as customer, s.name as salesman from customers c inner join salesman s on c.sale
sman_id = s.salesman_id where c.grade >200;

CUSTOMER             SALESMAN
-------------------- --------------------
Julian Green         Nail Knite
Fabian Johnson       Mc Lyon

SQL>
```

4. **Find customers in Paris and their corresponding salesmen's names.**

   SELECT C.CUST_NAME AS CUSTOMER, S.NAME AS SALESMAN FROM CUSTOMERS C INNER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID WHERE C.CITY = 'PARIS';

```
SQL> select c.cust_name as customer, s.name as salesman from customers c inner join salesman s on c.sale
sman_id = s.salesman_id where c.city = 'Paris';

CUSTOMER           SALESMAN
------------------ ------------------
Fabian Johnson     Mc Lyon

SQL>
```

5. **Retrieve the customer_id and the name of the salesman who serves them.**

   SELECT C.CUST_NAME AS CUSTOMER, S.NAME AS SALESMAN FROM CUSTOMERS C INNER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID;

```
SQL> select c.cust_name as customer, s.name as salesman from customers c inner join salesman s on c.sale
sman_id = s.salesman_id;

CUSTOMER           SALESMAN
------------------ ------------------
Nick Rimando       James Hoog
Brad Davis         James Hoog
Graham Zusi        Nail Knite
Julian Green       Nail Knite
Fabian Johnson     Mc Lyon
Geoff Cameron      Lauson Hen
Jozy Altidor       Paul Adam
Brad Guzan         Pit Alex

8 rows selected.

SQL>
```

6. **List all customers whose salesmen have a commission greater than 0.12.**

   SELECT C.CUST_NAME, S.NAME AS SALES_NAME, S.COMMISSION AS SALES_COMMISSION FROM CUSTOMERS C INNER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID WHERE S.COMMISSION >0.12;

```
SQL> select c.cust_name, s.name as sales_name, s.commission as sales_commission from customers c in
ner
 join salesman s on c.salesman_id = s.salesman_id where s.commission >0.12;

CUST_NAME          SALES_NAME         SALES_COMMISSION
------------------ ------------------ ----------------
Nick Rimando       James Hoog                      .15
Brad Davis         James Hoog                      .15
Graham Zusi        Nail Knite                      .13
Julian Green       Nail Knite                      .13
Fabian Johnson     Mc Lyon                         .14
Jozy Altidor       Paul Adam                       .13

6 rows selected.

SQL>
```

7. **Find the total number of customers each salesman has, using an inner join.**

   SELECT S.NAME AS SALES_NAME, COUNT(C.CUSTOMER_ID) AS TOTAL_CUSTOMER FROM CUSTOMERS C INNER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID GROUP BY S.NAME;

```
SQL> select s.name as sales_name, count(c.customer_id) as Total_Customer from customers c inner joi
n salesman s on c.salesman_id = s.salesman_id group by s.name;

SALES_NAME           TOTAL_CUSTOMER
-------------------- --------------
James Hoog                        2
Nail Knite                        2
Mc Lyon                           1
Lauson Hen                        1
Paul Adam                         1
Pit Alex                          1
```

8. **Retrieve all salesmen who have at least one customer.**

   SELECT S.NAME AS SALES_NAME, COUNT(C.CUSTOMER_ID) AS TOTAL_CUSTOMER FROM CUSTOMERS C INNER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID GROUP BY S.NAME HAVING COUNT(C.CUSTOMER_ID) = 1;

```
SQL> select s.name as sales_name, count(c.customer_id) as Total_Customer from customers c inner joi
n salesman s on c.salesman_id = s.salesman_id group by s.name having count(c.customer_id) = 1;

SALES_NAME           TOTAL_CUSTOMER
-------------------- --------------
Mc Lyon                           1
Lauson Hen                        1
Paul Adam                         1
Pit Alex                          1

SQL>
```

9. **Retrieve all salesmen and their customers using a left outer join.**

   SELECT S.NAME AS SALES_NAME, C.CUST_NAME FROM SALESMAN S LEFT OUTER JOIN CUSTOMERS C ON C.SALESMAN_ID = S.SALESMAN_ID;

```
SQL> select s.name as sales_name, c.cust_name from salesman s left outer join customers c on c.sale
sman_id = s.salesman_id;

SALES_NAME           CUST_NAME
-------------------- --------------------
James Hoog           Nick Rimando
James Hoog           Brad Davis
Nail Knite           Graham Zusi
Nail Knite           Julian Green
Mc Lyon              Fabian Johnson
Lauson Hen           Geoff Cameron
Paul Adam            Jozy Altidor
Pit Alex             Brad Guzan

8 rows selected.
```

10. **List all customers and their respective salesmen using a right outer join.**

    SELECT C.CUST_NAME, S.NAME AS SALES_NAME FROM CUSTOMERS C RIGHT OUTER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID;

```
SQL> select c.cust_name, s.name as sales_name from customers c right outer join salesman s on c.sal
esman_id = s.salesman_id;

CUST_NAME          SALES_NAME
------------------ ------------------
Nick Rimando       James Hoog
Brad Davis         James Hoog
Graham Zusi        Nail Knite
Julian Green       Nail Knite
Fabian Johnson     Mc Lyon
Geoff Cameron      Lauson Hen
Jozy Altidor       Paul Adam
Brad Guzan         Pit Alex

8 rows selected.
```

11. **Retrieve all customers even if they don't have a corresponding salesman.**

    SELECT C.CUST_NAME, S.NAME AS SALES_NAME FROM CUSTOMERS C LEFT OUTER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID;

```
SQL> select c.cust_name, s.name as sales_name from customers c left outer join salesman s on c.sale
sman_id = s.salesman_id;

CUST_NAME          SALES_NAME
------------------ ------------------
Nick Rimando       James Hoog
Brad Davis         James Hoog
Graham Zusi        Nail Knite
Julian Green       Nail Knite
Brad Guzan         Pit Alex
Fabian Johnson     Mc Lyon
Jozy Altidor       Paul Adam
Geoff Cameron      Lauson Hen

8 rows selected.

SQL>
```

12. **Show all salesmen along with the customer names they serve, even if the salesman has no customers.**
    SELECT S.NAME AS SALES_NAME, C.CUST_NAME FROM SALESMAN S LEFT OUTER JOIN CUSTOMERS C ON C.SALESMAN_ID = S.SALESMAN_ID;

```
SQL> select s.name as sales_name, c.cust_name from salesman s left outer join customers c on c.sale
sman_id = s.salesman_id;

SALES_NAME         CUST_NAME
------------------ ------------------
James Hoog         Nick Rimando
James Hoog         Brad Davis
Nail Knite         Graham Zusi
Nail Knite         Julian Green
Mc Lyon            Fabian Johnson
Lauson Hen         Geoff Cameron
Paul Adam          Jozy Altidor
Pit Alex           Brad Guzan

8 rows selected.

SQL>
```

13. **Find all salesmen in Paris and list their customers, including those who don't have any customers.**

    SELECT S.NAME AS SALES_NAME, C.CUST_NAME FROM SALESMAN S LEFT OUTER JOIN CUSTOMERS C ON C.SALESMAN_ID = S.SALESMAN_ID WHERE S.CITY = 'PARIS';

```
SQL> select s.name as sales_name, c.cust_name from salesman s left outer join customers c on c.sale
sman_id = s.salesman_id where s.city = 'Paris';

SALES_NAME           CUST_NAME
-------------------- --------------------
Nail Knite           Graham Zusi
Nail Knite           Julian Green
Mc Lyon              Fabian Johnson

SQL>
```

14. **Show all customers and their corresponding salesmen's details using a full outer join.**

    SELECT C.CUST_NAME, S.NAME AS SALES_NAME FROM CUSTOMERS C FULL OUTER JOIN SALESMAN S ON C.SALESMAN_ID = S.SALESMAN_ID;

```
SQL> select c.cust_name, s.name as sales_name from customers c full outer join salesman s on c.sale
sman_id = s.salesman_id;

CUST_NAME            SALES_NAME
-------------------- --------------------
Nick Rimando         James Hoog
Brad Davis           James Hoog
Graham Zusi          Nail Knite
Julian Green         Nail Knite
Fabian Johnson       Mc Lyon
Geoff Cameron        Lauson Hen
Jozy Altidor         Paul Adam
Brad Guzan           Pit Alex

8 rows selected.

SQL>
```

15. **Find pairs of salesmen working in the same city.**

    SELECT S1.NAME AS SALESMAN_1, S2.NAME AS SALESMAN_2, S1.CITY FROM SALESMAN S1 INNER JOIN SALESMAN S2 ON S1.CITY = S2.CITY AND S1.SALESMAN_ID < S2.SALESMAN_ID;

```
SQL> SELECT s1.name AS salesman_1, s2.name AS salesman_2, s1.city FROM salesman s1 INNER JOIN sales
man s2 ON s1.city = s2.city AND s1.salesman_id < s2.salesman_id;

SALESMAN_1           SALESMAN_2           CITY
-------------------- -------------------- ----------
Nail Knite           Mc Lyon              Paris

SQL>
```

16. **Find salesmen in New York who have colleagues also in New York.**

SELECT S1.NAME AS SALESMAN_1, S2.NAME AS COLLEAGUE, S1.CITY FROM SALESMAN S1 INNER JOIN SALESMAN S2 ON S1.CITY = S2.CITY AND S1.SALESMAN_ID <> S2.SALESMAN_ID WHERE S1.CITY = 'NEW YORK';

```
SQL> SELECT s1.name AS salesman_1, s2.name AS colleague, s1.city FROM salesman s1 INNER JOIN salesm
an s2 ON s1.city = s2.city AND s1.salesman_id <> s2.salesman_id WHERE s1.city = 'New York';

no rows selected

SQL> system
```

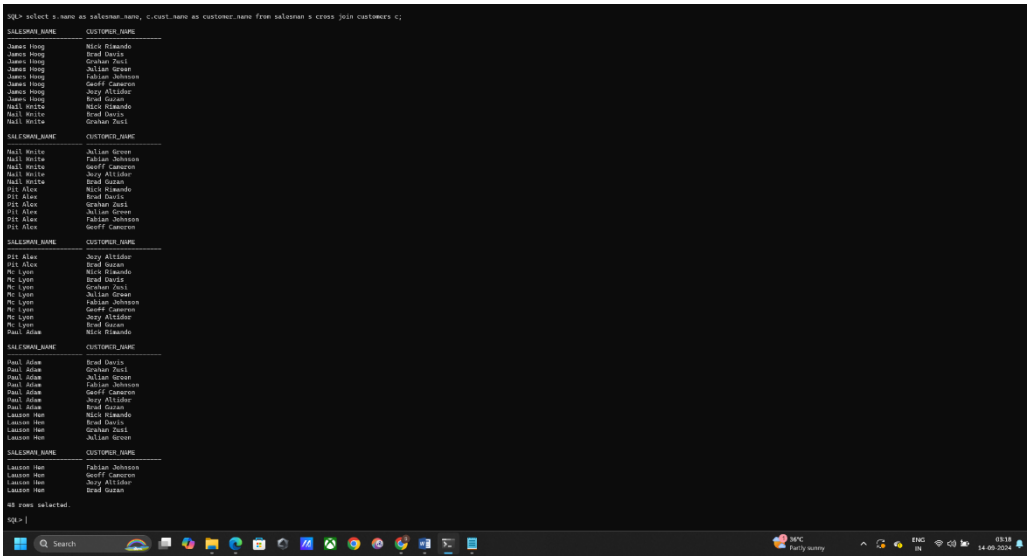
17. **List all salesmen pairs who are from different cities.**

SELECT S1.NAME AS SALESMAN_1, S1.CITY AS CITY_1, S2.NAME AS SALESMAN_2, S2.CITY AS CITY_2 FROM SALESMAN S1 INNER JOIN SALESMAN S2 ON S1.CITY <> S2.CITY AND S1.SALESMAN_ID < S2.SALESMAN_ID;

```
SQL> SELECT s1.name AS salesman_1, s1.city as city_1, s2.name as salesman_2, s2.city as city_2 FROM salesman s1 INNER JOIN salesman s2 ON s1.city
 <> s2.city AND s1.salesman_id < s2.salesman_id;

SALESMAN_1           CITY_1     SALESMAN_2           CITY_2
-------------------- ---------- -------------------- ----------
James Hoog           New York   Nail Knite           Paris
James Hoog           New York   Pit Alex             London
James Hoog           New York   Mc Lyon              Paris
James Hoog           New York   Paul Adam            Rome
James Hoog           New York   Lauson Hen           San Jose
Nail Knite           Paris      Pit Alex             London
Nail Knite           Paris      Paul Adam            Rome
Nail Knite           Paris      Lauson Hen           San Jose
Pit Alex             London     Mc Lyon              Paris
Pit Alex             London     Paul Adam            Rome
Mc Lyon              Paris      Paul Adam            Rome

SALESMAN_1           CITY_1     SALESMAN_2           CITY_2
-------------------- ---------- -------------------- ----------
Lauson Hen           San Jose   Pit Alex             London
Lauson Hen           San Jose   Mc Lyon              Paris
Lauson Hen           San Jose   Paul Adam            Rome

14 rows selected.
```

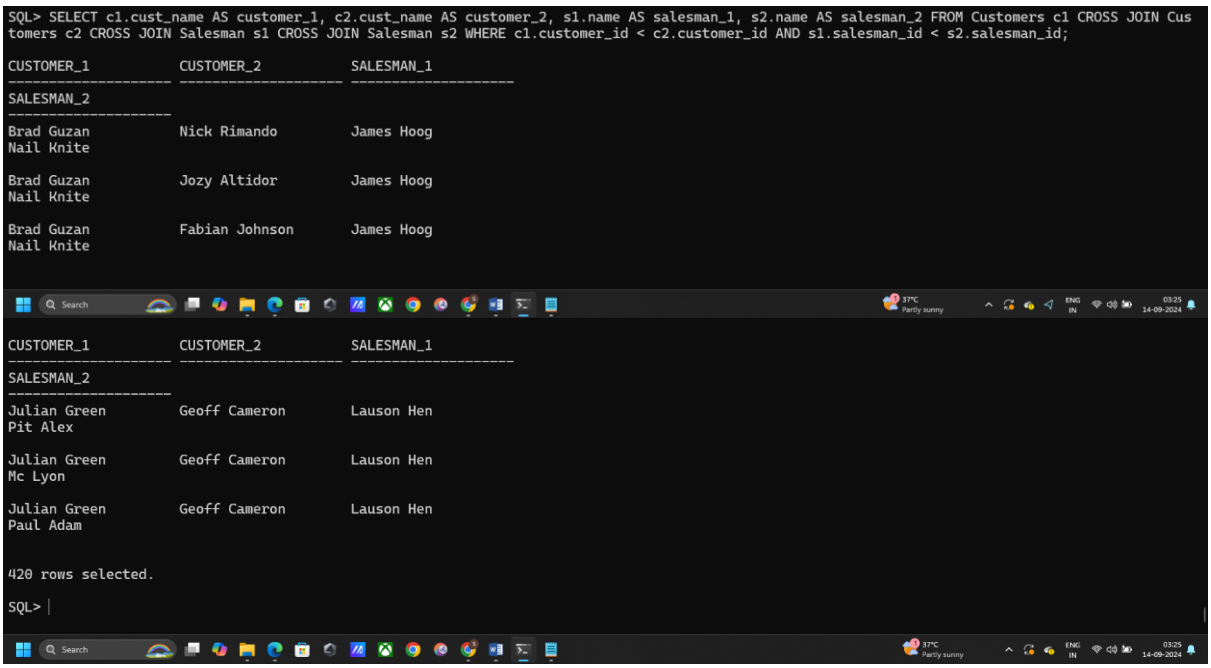
18. **Retrieve the Cartesian product of all salesmen and customers.**

SELECT S.NAME AS SALESMAN_NAME, C.CUST_NAME AS CUSTOMER_NAME FROM SALESMAN S CROSS JOIN CUSTOMERS C;



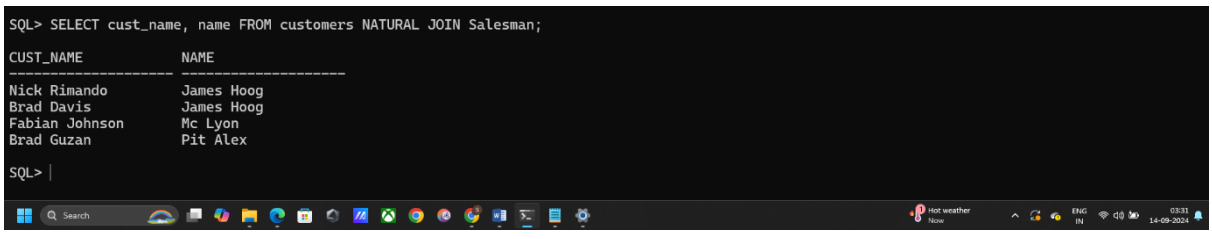
19. List all pairs of customers with all pairs of salesmen using a cross join.

SELECT C1.CUST_NAME AS CUSTOMER_1, C2.CUST_NAME AS CUSTOMER_2, S1.NAME AS SALESMAN_1, S2.NAME AS SALESMAN_2 FROM CUSTOMERS C1 CROSS JOIN CUSTOMERS C2 CROSS JOIN SALESMAN S1 CROSS JOIN SALESMAN S2 WHERE C1.CUSTOMER_ID < C2.CUSTOMER_ID AND S1.SALESMAN_ID < S2.SALESMAN_ID;



20. Perform a natural join to retrieve all customers and their corresponding salesmen.

SELECT CUST_NAME, NAME FROM CUSTOMERS NATURAL JOIN SALESMAN;



Q2. Using the same tables in Q1, use subqueries idea to find the following.

1. **Find the names of all salesmen who have customers in the city of "New York."**

   SELECT NAME FROM SALESMAN WHERE SALESMAN_ID IN (SELECT SALESMAN_ID FROM CUSTOMERS WHERE CITY = 'NEW YORK');

```
SQL> select name from salesman where salesman_id in (select salesman_id from customers where city = 'New York');

NAME
--------------------
James Hoog

SQL>
```

2. **Retrieve the cust_name of customers whose salesman has a commission greater than 0.13.**
   SELECT CUST_NAME FROM CUSTOMERS WHERE SALESMAN_ID IN(SELECT SALESMAN_ID FROM SALESMAN WHERE COMMISSION > 0.13);

```
SQL> select cust_name from customers where salesman_id in(select salesman_id from salesman where commission > 0.13);

CUST_NAME
--------------------
Nick Rimando
Brad Davis
Fabian Johnson
```

3. **List all salesmen who serve more than two customers.**

   SELECT NAME FROM SALESMAN WHERE SALESMAN_ID IN(SELECT SALESMAN_ID FROM CUSTOMERS GROUP BY SALESMAN_ID HAVING COUNT(SALESMAN_ID)=2);

```
SQL> select name from salesman where salesman_id in(select salesman_id from customers group by salesman_id having coun
t(salesman_id)=2);

NAME
--------------------
James Hoog
Nail Knite

SQL>
```

4. **Find the names of customers who have the same city as any salesman.**
   SELECT CUST_NAME, CITY FROM CUSTOMERS WHERE CITY IN (SELECT CITY FROM SALESMAN);

```
SQL> select cust_name, city from customers where city in (select city from salesman);

CUST_NAME           CITY
------------------- ----------
Nick Rimando        New York
Brad Davis          New York
Fabian Johnson      Paris
Julian Green        London
Brad Guzan          London

SQL>
```

5. **Retrieve the details of the salesman with the highest commission.**

   select * from salesman where commission = (select max(commission) from salesman);

```
SQL> select * from salesman where commission = (select max(commission) from salesman);

SALESMAN_ID NAME                 CITY       COMMISSION
----------- -------------------- ---------- ----------
       5001 James Hoog           New York          .15

SQL>
```

6. **List the customer_id and cust_name of customers whose salesmen work in "Paris.**
   SELECT CUSTOMER_ID, CUST_NAME FROM CUSTOMERS WHERE SALESMAN_ID IN (SELECT SALESMAN_ID FROM SALESMAN WHERE CITY='PARIS');

```
SQL> select customer_id, cust_name from customers where salesman_id in (select salesman_id from salesman where city='Paris');

CUSTOMER_ID CUST_NAME
----------- --------------------
       3005 Graham Zusi
       3008 Julian Green
       3004 Fabian Johnson

SQL>
```

7. **List all customers who are served by salesmen from cities other than their own.**

   SELECT * FROM CUSTOMERS WHERE CITY IN (SELECT CITY FROM SALESMAN);

```
SQL> select * from customers where city in (select city from salesman);

CUSTOMER_ID CUST_NAME            CITY           GRADE SALESMAN_ID
----------- -------------------- ---------- ---------- -----------
       3002 Nick Rimando         New York          100        5001
       3007 Brad Davis           New York          200        5001
       3004 Fabian Johnson       Paris             300        5006
       3008 Julian Green         London            300        5002
       3001 Brad Guzan           London            100        5005

SQL>
```

8. **Retrieve the name of salesmen whose commission is greater than the commission of any salesman from "London."**

   SELECT NAME, COMMISSION FROM SALESMAN WHERE COMMISSION > ALL(SELECT COMMISSION FROM SALESMAN WHERE CITY = 'LONDON');

```
SQL> select name, commission from salesman where commission > all(select commission from salesman where city = 'London');

NAME                 COMMISSION
-------------------- ----------
Lauson Hen                  .12
Nail Knite                  .13
Paul Adam                   .13
Mc Lyon                     .14
James Hoog                  .15

SQL>
```