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# Database Engineering Lab

Database on Electrical Machines which has tables as given below :

1. Show Tables :

```
MariaDB [Machines]> show tables
    -> ;
+--------------------+
| Tables_in_machines |
+--------------------+
| customer           |
| dc_motor           |
| dc_motor_brand     |
| m_order            |
| motor              |
| motor_brand        |
| transformer        |
| transformer_brand  |
| warehouse          |
+--------------------+
9 rows in set (0.005 sec)

MariaDB [Machines]>
```

2. Warehouse contents :

```
MariaDB [Machines]> select * from warehouse;
+------------+-------------------------+
| machine_id | machine_type            |
+------------+-------------------------+
|          1 | ac-motor                |
|          2 | single-phase-transformer |
|          3 | 3-phase-transformer     |
|          4 | dc-motor                |
|          5 | UNKNOWN                 |
+------------+-------------------------+
5 rows in set (0.004 sec)
```

3. Transformer contents :

```
MariaDB [Machines]> select * from transformer;
+---------------+------------+---------------------+------------------+---------------+
| transformer_id | machine_id | manufacturer_name   | rating_of_machine | machine_price |
+---------------+------------+---------------------+------------------+---------------+
|             1 |          2 | Cummins transformers |              100 |         10000 |
|             2 |          2 | Siemens transformers |               43 |          3000 |
|             3 |          2 | Cummins transformers |               90 |          1000 |
|             4 |          3 | Lunar transformers  |               79 |         50000 |
|             5 |          3 | ABB transformers    |               87 |         30000 |
|             6 |          3 | simens transformers |               99 |         78000 |
+---------------+------------+---------------------+------------------+---------------+
```

4. Transformer_brand contents :

```
MariaDB [Machines]> select * from transformer_brand;
+----------+----------------+------------------+
| brand_id | transformer_id | brand_name       |
+----------+----------------+------------------+
|        1 |              1 | Trans Tronics    |
|        2 |              2 | Sonal Enterprizes|
|        3 |              3 | SS Transformers  |
+----------+----------------+------------------+
3 rows in set (0.000 sec)
```

5. Motor Content :

```
MariaDB [Machines]> select * from motor;
+----------+------------+-------------------+-----------------+---------------+
| motor_id | machine_id | manufacturer_name | power_of_machine | machine_price |
+----------+------------+-------------------+-----------------+---------------+
|        1 |          1 | Cummins           |             100 |         10000 |
|        2 |          1 | Siemens           |              43 |          3000 |
|        3 |          1 | Cummins           |              90 |          1000 |
|        4 |          1 | Lunar             |              79 |         50000 |
|        5 |          1 | ABB motors        |              87 |         30000 |
|        6 |          1 | simens            |              99 |         78000 |
+----------+------------+-------------------+-----------------+---------------+
6 rows in set (0.000 sec)
```

6. Motor_Brand Content :

```
MariaDB [Machines]> select * from motor_brand;
+----------+----------+------------+
| brand_id | motor_id | brand_name |
+----------+----------+------------+
|        1 |        1 | Cummins    |
|        2 |        2 | Siemens    |
|        3 |        3 | Lunar      |
|        4 |        4 | ABB motors |
+----------+----------+------------+
4 rows in set (0.000 sec)
```

7. Dc Motor contents :

```
MariaDB [Machines]> select * from dc_motor;
+-------------+------------+-------------------+-----------------+---------------+
| dc_motor_id | machine_id | manufacturer_name | power_of_machine | machine_price |
+-------------+------------+-------------------+-----------------+---------------+
|           1 |          4 | Cummins           |             100 |          8000 |
|           2 |          4 | Siemens           |              43 |          2400 |
|           3 |          4 | Cummins           |              90 |           500 |
+-------------+------------+-------------------+-----------------+---------------+
3 rows in set (0.000 sec)
```

8. DC Motor Brand contents :

```
MariaDB [Machines]> select * from dc_motor_brand;
+----------+-------------+-------------+
| brand_id | dc_motor_id | brand_name  |
+----------+-------------+-------------+
|        1 |           1 | Gujrat      |
|        2 |           2 | AVR         |
|        3 |           3 | ABC         |
+----------+-------------+-------------+
3 rows in set (0.000 sec)
```

9. Machine Order (m_order) contents :

```
MariaDB [Machines]> select * from m_order;
+----------+------------+---------------+------------+------------+
| order_id | machine_id | order_address | order_date | Total_bill |
+----------+------------+---------------+------------+------------+
|        1 |          1 | sangli        | 2022-10-22 |      25000 |
|        2 |          2 | miraj         | 2022-10-30 |      30000 |
|        3 |          3 | kupwad        | 2022-11-05 |      30000 |
+----------+------------+---------------+------------+------------+
3 rows in set (0.000 sec)
```

10. Customer Contents :

```
MariaDB [Machines]> select * from customer;
+---------+----------+------------------+-------------+
| cust_id | order_id | cust_name        | bill_amount |
+---------+----------+------------------+-------------+
|       1 |        1 | Tesla            |      100000 |
|       2 |        2 | AEG Enetrprizes  |       10000 |
|       3 |        3 | Anand Enterprizes|       50000 |
+---------+----------+------------------+-------------+
3 rows in set (0.000 sec)
```

➢ **Queries :**
1. Logical Operator :

Query : select * from machines where power_of_machine=50 or power_of_machine=100;

```
MariaDB [Machines]> select * from motor Where power_of_machine=50 or power_of_machine=100;
+----------+------------+-------------------+------------------+---------------+
| motor_id | machine_id | manufacturer_name | power_of_machine | machine_price |
+----------+------------+-------------------+------------------+---------------+
|        1 |          1 | Cummins           |              100 |         10000 |
+----------+------------+-------------------+------------------+---------------+
1 row in set (0.004 sec)
```

2. Comparison Operator :

Query : select * from dc_motor where power_of_machine >= 50;

```
MariaDB [Machines]> select * from dc_motor where power_of_machine >= 50;
+-------------+------------+-------------------+------------------+---------------+
| dc_motor_id | machine_id | manufacturer_name | power_of_machine | machine_price |
+-------------+------------+-------------------+------------------+---------------+
|           1 |          4 | Cummins           |              100 |          8000 |
|           3 |          4 | Cummins           |               90 |           500 |
+-------------+------------+-------------------+------------------+---------------+
2 rows in set (0.000 sec)
```

3. Range Operator :

Query : select * from m_order where Total_bill between 20000 and 30000;

```
MariaDB [Machines]> select * from m_order where Total_bill between 20000 and 30000;
+----------+------------+---------------+------------+------------+
| order_id | machine_id | order_address | order_date | Total_bill |
+----------+------------+---------------+------------+------------+
|        1 |          1 | sangli        | 2022-10-22 |      25000 |
|        2 |          2 | miraj         | 2022-10-30 |      30000 |
|        3 |          3 | kupwad        | 2022-11-05 |      30000 |
+----------+------------+---------------+------------+------------+
3 rows in set (0.019 sec)
```

4. In Clouse :

Query : select * from transformer where  manufacturer_name IN('Cummins transformer','Siemens transformer');

```
MariaDB [Machines]> select * from transformer where manufacturer_name IN('Cummins transformers','Siemens transformers');
+----------------+------------+----------------------+------------------+---------------+
| transformer_id | machine_id | manufacturer_name    | rating_of_machine | machine_price |
+----------------+------------+----------------------+------------------+---------------+
|              1 |          2 | Cummins transformers |              100 |         10000 |
|              2 |          2 | Siemens transformers |               43 |          3000 |
|              3 |          2 | Cummins transformers |               90 |          1000 |
+----------------+------------+----------------------+------------------+---------------+
3 rows in set (0.000 sec)
```

5. Like Clouse :

Query : select * from customer where cust_name like '%E%';

```
MariaDB [Machines]> select * from customer where cust_name like '%E%';
+---------+----------+------------------+-------------+
| cust_id | order_id | cust_name        | bill_amount |
+---------+----------+------------------+-------------+
|       1 |        1 | Tesla            |      100000 |
|       2 |        2 | AEG Enetrprizes  |       10000 |
|       3 |        3 | Anand Enterprizes |      50000 |
+---------+----------+------------------+-------------+
3 rows in set (0.000 sec)
```

6. Agregation Clouse :

Query : select max(Total_bill) as new from m_order;

```
MariaDB [Machines]> select max(Total_bill) as new from m_order;
+-------+
| new   |
+-------+
| 30000 |
+-------+
1 row in set (0.020 sec)
```

7. Order by clouse :

Query: select * from motor order by power_of_machine;

```
MariaDB [Machines]> select * from motor order by power_of_machine;
+----------+------------+-------------------+-----------------+---------------+
| motor_id | machine_id | manufacturer_name | power_of_machine | machine_price |
+----------+------------+-------------------+-----------------+---------------+
|        2 |          1 | Siemens           |              43 |          3000 |
|        4 |          1 | Lunar             |              79 |         50000 |
|        5 |          1 | ABB motors        |              87 |         30000 |
|        3 |          1 | Cummins           |              90 |          1000 |
|        6 |          1 | simens            |              99 |         78000 |
|        1 |          1 | Cummins           |             100 |         10000 |
+----------+------------+-------------------+-----------------+---------------+
6 rows in set (0.000 sec)
```

8. Having Clouse :

Query :  select count(cust_name), bill_amount, order_id from customer group by order_id having bill_amount > 10000 order by order_id;

```
MariaDB [Machines]> select count(cust_name), bill_amount, order_id from customer group by order_id having bill_amount > 1000
0 order by order_id;
+-----------------+-------------+----------+
| count(cust_name) | bill_amount | order_id |
+-----------------+-------------+----------+
|               1 |      100000 |        1 |
|               1 |       50000 |        3 |
+-----------------+-------------+----------+
2 rows in set (0.000 sec)
```

9. Nested Query :

Query :  select * from motor where power_of_machine < ( select avg(power_of_machine) from motor);

```
MariaDB [Machines]> select * from motor where power_of_machine < ( select avg(power_of_machine) from motor);
+----------+------------+-------------------+-----------------+---------------+
| motor_id | machine_id | manufacturer_name | power_of_machine | machine_price |
+----------+------------+-------------------+-----------------+---------------+
|        2 |          1 | Siemens           |              43 |          3000 |
|        4 |          1 | Lunar             |              79 |         50000 |
+----------+------------+-------------------+-----------------+---------------+
2 rows in set (0.000 sec)
```

10. Between Clouse :

Query :  select * from motor where machine_price not between 1000 and 30000;

```
MariaDB [Machines]> select * from motor where machine_price not between 1000 and 30000;
+----------+------------+-------------------+------------------+---------------+
| motor_id | machine_id | manufacturer_name | power_of_machine | machine_price |
+----------+------------+-------------------+------------------+---------------+
|        4 |          1 | Lunar             |               79 |         50000 |
|        6 |          1 | simens            |               99 |         78000 |
+----------+------------+-------------------+------------------+---------------+
2 rows in set (0.000 sec)
```