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CS457L

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QUIZ#2

1.

Create a table named ‘test’ for the data.

```
MariaDB [19610dm]> create table test(
    -> a int, b int, c int, d int);
Query OK, 0 rows affected (0.013 sec)

MariaDB [19610dm]> insert into test
    -> values(1,1,1,0),(1,1,1,0),(1,1,1,0),(1,1,2,1)
    -> ,(1,1,2,0),(1,1,2,0),(1,1,3,0),(1,1,3,0),(1,1,3,0);
Query OK, 9 rows affected (0.003 sec)
Records: 9  Duplicates: 0  Warnings: 0

MariaDB [19610dm]> select * from test;
+------+------+------+------+
| a    | b    | c    | d    |
+------+------+------+------+
|    1 |    1 |    1 |    0 |
|    1 |    1 |    1 |    0 |
|    1 |    1 |    1 |    0 |
|    1 |    1 |    2 |    1 |
|    1 |    1 |    2 |    0 |
|    1 |    1 |    2 |    0 |
|    1 |    1 |    3 |    0 |
|    1 |    1 |    3 |    0 |
|    1 |    1 |    3 |    0 |
+------+------+------+------+
9 rows in set (0.000 sec)
```

A SQL query that returns any two rows out of the list of 9 rows

```
MariaDB [19610dm]> select * from test order by rand() limit 2;
+------+------+------+------+
| a    | b    | c    | d    |
+------+------+------+------+
|    1 |    1 |    2 |    0 |
|    1 |    1 |    3 |    0 |
+------+------+------+------+
2 rows in set (0.000 sec)

MariaDB [19610dm]> select * from test order by rand() limit 2;
+------+------+------+------+
| a    | b    | c    | d    |
+------+------+------+------+
|    1 |    1 |    2 |    0 |
|    1 |    1 |    1 |    0 |
+------+------+------+------+
2 rows in set (0.000 sec)

MariaDB [19610dm]> select * from test order by rand() limit 2;
+------+------+------+------+
| a    | b    | c    | d    |
+------+------+------+------+
|    1 |    1 |    1 |    0 |
|    1 |    1 |    2 |    0 |
+------+------+------+------+
2 rows in set (0.000 sec)

MariaDB [19610dm]> select * from test order by rand() limit 2;
+------+------+------+------+
| a    | b    | c    | d    |
+------+------+------+------+
|    1 |    1 |    3 |    0 |
|    1 |    1 |    2 |    0 |
+------+------+------+------+
2 rows in set (0.000 sec)
```

This query selects 2 rows randomly from the ‘test’ table.

a. From the original list of nine rows, display the first 3 column entries.

```
MariaDB [19610dm]> select * from test limit 3;
+------+------+------+------+
| a    | b    | c    | d    |
+------+------+------+------+
|    1 |    1 |    1 |    0 |
|    1 |    1 |    1 |    0 |
|    1 |    1 |    1 |    0 |
+------+------+------+------+
3 rows in set (0.000 sec)
```

b. Sum the column entries which does not have a zero in it (for instance, the last column entries have zero in it. You may not want to add the column entries on the last column, since it has all zeros in it).

```
MariaDB [19610dm]> select if(0 in (a),NULL,sum(a)) as sum_a,
    -> if(0 in (b),NULL,sum(b)) as sum_b,
    -> if(0 in (c),NULL,sum(c)) as sum_c,
    -> if(0 in (d),NULL,sum(d)) as sum_d from test;
+-------+-------+-------+-------+
| sum_a | sum_b | sum_c | sum_d |
+-------+-------+-------+-------+
|     9 |     9 |    18 |  NULL |
+-------+-------+-------+-------+
1 row in set (0.000 sec)
```

c. Create a view (subset of a Table) which contains the first 3 columns. Display the view.

```
MariaDB [19610dm]> create view test_view as
    -> select a,b,c from test;
Query OK, 0 rows affected (0.002 sec)

MariaDB [19610dm]> select * from test_view;
+------+------+------+
| a    | b    | c    |
+------+------+------+
|    1 |    1 |    1 |
|    1 |    1 |    1 |
|    1 |    1 |    1 |
|    1 |    1 |    2 |
|    1 |    1 |    2 |
|    1 |    1 |    2 |
|    1 |    1 |    3 |
|    1 |    1 |    3 |
|    1 |    1 |    3 |
+------+------+------+
9 rows in set (0.000 sec)
```

d. Now, insert into the view the following rows: (4, 5, 6), (5, 7, -3), (6, 4, -8).

```
MariaDB [19610dm]> insert into test_view values(4,5,6);
Query OK, 1 row affected (0.003 sec)

MariaDB [19610dm]> insert into test_view values(5,7,-3);
Query OK, 1 row affected (0.003 sec)

MariaDB [19610dm]> insert into test_view values(6,4,-8);
Query OK, 1 row affected (0.003 sec)

MariaDB [19610dm]> select * from test_view;
+------+------+------+
| a    | b    | c    |
+------+------+------+
|    1 |    1 |    1 |
|    1 |    1 |    1 |
|    1 |    1 |    1 |
|    1 |    1 |    2 |
|    1 |    1 |    2 |
|    1 |    1 |    2 |
|    1 |    1 |    3 |
|    1 |    1 |    3 |
|    1 |    1 |    3 |
|    4 |    5 |    6 |
|    5 |    7 |   -3 |
|    6 |    4 |   -8 |
+------+------+------+
12 rows in set (0.000 sec)
```

e. From the updated view in part (d), display only those rows which have one of their elements as negative.

```
MariaDB [19610dm]> select * from test_view where
    -> a < 0 or b < 0 or c < 0;
+------+------+------+
| a    | b    | c    |
+------+------+------+
|    5 |    7 |   -3 |
|    6 |    4 |   -8 |
+------+------+------+
2 rows in set (0.001 sec)
```

f. Now, rearrange the rows in the View so that they are listed in the descending order of their row sum. (Note: Rows which have higher row sum will be listed on the top).

```
MariaDB [19610dm]> select a,b,c,(a+b+c) as sum from test_view
    -> order by sum desc;
+------+------+------+------+
| a    | b    | c    | sum  |
+------+------+------+------+
|    4 |    5 |    6 |   15 |
|    5 |    7 |   -3 |    9 |
|    1 |    1 |    3 |    5 |
|    1 |    1 |    3 |    5 |
|    1 |    1 |    3 |    5 |
|    1 |    1 |    2 |    4 |
|    1 |    1 |    2 |    4 |
|    1 |    1 |    2 |    4 |
|    1 |    1 |    1 |    3 |
|    1 |    1 |    1 |    3 |
|    1 |    1 |    1 |    3 |
|    6 |    4 |   -8 |    2 |
+------+------+------+------+
12 rows in set (0.000 sec)
```

2.

a. Implement a Three-way Join (can be any type of Joins) between different Tables.

```
MariaDB [19610dm]> select E.Fname, E.Lname from
    -> EMPLOYEE as E join WORKS_ON as W on W.Essn = E.Ssn
    -> join PROJECT as P on W.Pno = P.Pnumber
    -> join DEPARTMENT as D on D.Dnumber = E.Dno;
+----------+---------+
| Fname    | Lname   |
+----------+---------+
| Franklin | Wong    |
| John     | Smith   |
| Joyce    | English |
| John     | Smith   |
| Franklin | Wong    |
| Joyce    | English |
| Franklin | Wong    |
| Ramesh   | Narayan |
| Franklin | Wong    |
| James    | Borg    |
+----------+---------+
10 rows in set (0.001 sec)
```

b. Implement a Three-way Join (one inner join, two outer) between different Tables comprising two sub-queries.

Since the MariaDB does not support full outer join, we can mimic outer join by union left outer and right outer join.

c.

d. Cross-join

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

DEPT_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

WORKS_ON **PROJECT**

```
MariaDB [19610dm]> select * from DEPARTMENT cross join DEPT_LOCATIONS;
+----------------+---------+-----------+-----------------+---------+-----------+
| Dname          | Dnumber | Mgr_ssn   | Mgr_start_date  | Dnumber | Dlocation |
+----------------+---------+-----------+-----------------+---------+-----------+
| Headquarters   |       1 | 888665555 | 1981-06-19      |       1 | Houston   |
| Administration |       4 | 987654321 | 1995-01-01      |       1 | Houston   |
| Research       |       5 | 333445555 | 1988-05-22      |       1 | Houston   |
| Headquarters   |       1 | 888665555 | 1981-06-19      |       4 | Stafford  |
| Administration |       4 | 987654321 | 1995-01-01      |       4 | Stafford  |
| Research       |       5 | 333445555 | 1988-05-22      |       4 | Stafford  |
| Headquarters   |       1 | 888665555 | 1981-06-19      |       5 | Bellaire  |
| Administration |       4 | 987654321 | 1995-01-01      |       5 | Bellaire  |
| Research       |       5 | 333445555 | 1988-05-22      |       5 | Bellaire  |
| Headquarters   |       1 | 888665555 | 1981-06-19      |       5 | Houston   |
| Administration |       4 | 987654321 | 1995-01-01      |       5 | Houston   |
| Research       |       5 | 333445555 | 1988-05-22      |       5 | Houston   |
| Headquarters   |       1 | 888665555 | 1981-06-19      |       5 | Sugarland |
| Administration |       4 | 987654321 | 1995-01-01      |       5 | Sugarland |
| Research       |       5 | 333445555 | 1988-05-22      |       5 | Sugarland |
+----------------+---------+-----------+-----------------+---------+-----------+
15 rows in set (0.000 sec)
```

e. Self-join

```
MariaDB [19610dm]> select E.Fname, E.Lname, D.Dname
    -> from EMPLOYEE as E, DEPARTMENT as D
    -> where E.Salary >= 30000;
+----------+---------+----------------+
| Fname    | Lname   | Dname          |
+----------+---------+----------------+
| Alicia   | Smith   | Administration |
| Alicia   | Smith   | Headquarters   |
| Alicia   | Smith   | Research       |
| John     | Smith   | Administration |
| John     | Smith   | Headquarters   |
| John     | Smith   | Research       |
| Franklin | Wong    | Administration |
| Franklin | Wong    | Headquarters   |
| Franklin | Wong    | Research       |
| Joyce    | English | Administration |
| Joyce    | English | Headquarters   |
| Joyce    | English | Research       |
| Ramesh   | Narayan | Administration |
| Ramesh   | Narayan | Headquarters   |
| Ramesh   | Narayan | Research       |
| John     | Zelaya  | Administration |
| John     | Zelaya  | Headquarters   |
| John     | Zelaya  | Research       |
| James    | Borg    | Administration |
| James    | Borg    | Headquarters   |
| James    | Borg    | Research       |
+----------+---------+----------------+
21 rows in set (0.000 sec)
```

f. Natural join

```
MariaDB [19610dm]> select * from DEPARTMENT natural join DEPT_LOCATIONS;
+---------+----------------+-----------+----------------+-----------+
| Dnumber | Dname          | Mgr_ssn   | Mgr_start_date | Dlocation |
+---------+----------------+-----------+----------------+-----------+
|       1 | Headquarters   | 888665555 | 1981-06-19     | Houston   |
|       4 | Administration | 987654321 | 1995-01-01     | Stafford  |
|       5 | Research       | 333445555 | 1988-05-22     | Bellaire  |
|       5 | Research       | 333445555 | 1988-05-22     | Houston   |
|       5 | Research       | 333445555 | 1988-05-22     | Sugarland |
+---------+----------------+-----------+----------------+-----------+
5 rows in set (0.000 sec)
```

3.

```
MariaDB [19610dm]> select s.name from
    -> student as s right join grade_report as g on g.student_number = s.student_number
    -> left join section as z on z.section_identifier = g.section_identifier
    -> join course as c on c.course_number = z.course_number;
+-------+
| name  |
+-------+
| Brown |
| Brown |
| Brown |
| Smith |
| Smith |
| Brown |
+-------+
6 rows in set (0.001 sec)
```

```
MariaDB [19610dm]> select s.name,g.grade,c.department from student as s inner join grade_repo
rt as g on g.student_number = s.student_number join section as z on z.section_identifier = g.
section_identifier right join course as c on c.course_number = z.course_number;
+-------+-------+------------+
| name  | grade | department |
+-------+-------+------------+
| Brown | A     | MATH       |
| Brown | A     | CS         |
| Brown | B     | CS         |
| Smith | B     | MATH       |
| Smith | C     | CS         |
| Brown | A     | CS         |
+-------+-------+------------+
6 rows in set (0.001 sec)
```