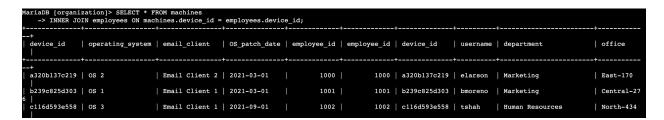# Complete a join SQL queries

Project description

A recent security incident has happened where some machines are compromised.
I am responsible to investigate by acquiring information from the database.

The responsibilities include:

1. Identifying which employees that used the machines
2. Getting data of machines that assigned to specific user and machines that do not belong to any user
3. List all login attempts made by all employees

Match employees to their machines

To identify data of machines assigned I must locate the **machines** information and `employees` tables.

```
MariaDB [organization]> SELECT * FROM machines
    -> INNER JOIN employees ON machines.device_id = employees.device_id;
+--------------+------------------+--------------+---------------+-------------+-------------+--------------+----------+----------------------+-----------
--+
| device_id    | operating_system | email_client | OS_patch_date | employee_id | employee_id | device_id    | username | department           | office
 |
+--------------+------------------+--------------+---------------+-------------+-------------+--------------+----------+----------------------+-----------
--+
| a320b137c219 | OS 2             | Email Client 2 | 2021-03-01  |        1000 |        1000 | a320b137c219 | elarson  | Marketing            | East-170
 |
| b239c825d303 | OS 1             | Email Client 1 | 2021-03-01  |        1001 |        1001 | b239c825d303 | bmoreno  | Marketing            | Central-27
6 |
| c116d593e558 | OS 3             | Email Client 1 | 2021-09-01  |        1002 |        1002 | c116d593e558 | tshah    | Human Resources      | North-434
 |
```

- `INNER JOIN` joins `employees` and `machines` tables to a common column which is the `device_id` column.
- The `ON` operator ensures both columns are joined.

Return more data

Next is to reverse and retrieve information of all employees and any machines that are assigned to them.

```
MariaDB [organization]> SELECT *
    -> FROM machines
    -> LEFT JOIN employees ON machines.device_id = employees.device_id;
+--------------+------------------+----------------+---------------+-------------+-------------+--------------+-----------+------------------+------------------+----------+
| device_id    | operating_system | email_client   | OS_patch_date | employee_id | employee_id | device_id    | username  | department       | office           |
+--------------+------------------+----------------+---------------+-------------+-------------+--------------+-----------+------------------+------------------+----------+
| a320b137c219 | OS 2             | Email Client 2 | 2021-03-01    |        1000 |        1000 | a320b137c219 | elarson   | Marketing        | East-170         |
| b239c825d303 | OS 1             | Email Client 1 | 2021-03-01    |        1001 |        1001 | b239c825d303 | bmoreno   | Marketing        | Central-276      |
| c116d593e558 | OS 3             | Email Client 1 | 2021-09-01    |        1002 |        1002 | c116d593e558 | tshah     | Human Resources  | North-434        |
```

```
MariaDB [organization]> SELECT *
    -> FROM machines
    -> RIGHT JOIN employees ON machines.device_id = employees.device_id;
+--------------+------------------+----------------+---------------+-------------+-------------+--------------+-----------+------------------+------------------+----------+
| device_id    | operating_system | email_client   | OS_patch_date | employee_id | employee_id | device_id    | username  | department       | office           |
+--------------+------------------+----------------+---------------+-------------+-------------+--------------+-----------+------------------+------------------+----------+
| a320b137c219 | OS 2             | Email Client 2 | 2021-03-01    |        1000 |        1000 | a320b137c219 | elarson   | Marketing        | East-170         |
| b239c825d303 | OS 1             | Email Client 1 | 2021-03-01    |        1001 |        1001 | b239c825d303 | bmoreno   | Marketing        | Central-276      |
| c116d593e558 | OS 3             | Email Client 1 | 2021-09-01    |        1002 |        1002 | c116d593e558 | tshah     | Human Resources  | North-434        |
```

- `LEFT JOIN` and `ON` operator joins all records from `machines` and `employees` tables through a left join.
- `RIGHT JOIN` and `ON` operator joins all records from `machines` and `employees` tables through a right join.

Retrieve login attempt data

After retrieving machines data, I must retrieve information on all employees who have made login attempts.

```
MariaDB [organization]> SELECT *
    -> FROM employees
    -> INNER JOIN log_in_attempts ON employees.username = log_in_attempts.username;
+-------------+--------------+----------+------------------------+-------------+----------+----------+------------+------------+---------+-----------------+---------+
| employee_id | device_id    | username | department             | office      | event_id | username | login_date | login_time | country | ip_address      | success |
+-------------+--------------+----------+------------------------+-------------+----------+----------+------------+------------+---------+-----------------+---------+
|        1032 | g773h303i639 | jrafael  | Information Technology  | Central-309 |        1 | jrafael  | 2022-05-09 | 04:56:27   | CAN     | 192.168.243.140 |       0 |
|        1026 | a998b568c863 | apatel   | Human Resources        | West-320    |        2 | apatel   | 2022-05-10 | 20:27:27   | CAN     | 192.168.205.12  |       0 |
|        1031 | f419g188h578 | dkot     | Marketing              | West-408    |        3 | dkot     | 2022-05-09 | 06:47:41   | USA     | 192.168.151.162 |       0 |
```

- `INNER JOIN` and `ON` operator joins the `employees` and `log_in_attempts` tables to link both tables on the common `username` column.