Completing A Join In SQL

Case Study:

In this scenario, you'll investigate a recent security incident that compromised some machines.

You are responsible for getting the required information from the database for the investigation.

Here's how you'll do this task: First, you'll use an inner join to identify which employees are using which machines. Second, you'll use left and right joins to find machines that do not belong to any specific user and users who do not have any specific machine assigned to them. Finally, you'll use an inner join to list all login attempts made by all employees.

Task 1. Match employees to their machines

First, you must identify which employees are using which machines. The data is located in the `machines` 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 | employ
ee_id | employee_id | device_id   | username | department           | of
fice      |
+--------------+------------------+---------------+---------------+-------
------+-------------+-------------+----------+----------------------+---
----------+
| a320b137c219 | OS 2             | Email Client 2 | 2021-03-01    |
 1000 |        1000 | a320b137c219 | elarson  | Marketing            | Ea
st-170    |
| b239c825d303 | OS 1             | Email Client 1 | 2021-03-01    |
 1001 |        1001 | b239c825d303 | bmoreno  | Marketing            | Ce
ntral-276 |
| c116d593e558 | OS 3             | Email Client 1 | 2021-09-01    |
 1002 |        1002 | c116d593e558 | tshah    | Human Resources      | No
rth-434   |
| d394e816f943 | OS 3             | Email Client 2 | 2021-03-01    |
 1003 |        1003 | d394e816f943 | sgilmore | Finance              | So
uth-153   |
| e218f877g788 | OS 2             | Email Client 1 | 2021-09-01    |
 1004 |        1004 | e218f877g788 | eraab    | Human Resources      | So
```

Task 2. Return more data

You now must return the information on all machines and the employees who have machines. Next, you must do the reverse and retrieve the 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 | employ
ee_id | employee_id | device_id   | username | department            | of
fice      |
+--------------+------------------+---------------+--------------+-------
------+-------------+-------------+----------+-----------------------+---
----------+
| a320b137c219 | OS 2             | Email Client 2 | 2021-03-01    |
 1000 |        1000 | a320b137c219 | elarson  | Marketing             | Ea
st-170    |
| b239c825d303 | OS 1             | Email Client 1 | 2021-03-01    |
 1001 |        1001 | b239c825d303 | bmoreno  | Marketing             | Ce
ntral-276 |
| c116d593e558 | OS 3             | Email Client 1 | 2021-09-01    |
 1002 |        1002 | c116d593e558 | tshah    | Human Resources       | No
rth-434   |
| d394e816f943 | OS 3             | Email Client 2 | 2021-03-01    |
 1003 |        1003 | d394e816f943 | sgilmore | Finance               | So
uth-153   |
| e218f877g788 | OS 2             | Email Client 1 | 2021-09-01    |
 1004 |        1004 | e218f877g788 | eraab    | Human Resources       | So
uth-127   |
```

Task 3. Retrieve login attempt data

To continue investigating the security incident, you must retrieve the 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.u
sername;
+-------------+--------------+----------+-----------------------+---------
----+----------+----------+-----------+-----------+---------+-----------
-----+---------+
| 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 |
|        1031 | f419g188h578 | dkot     | Marketing              | West-408
    |        4 | dkot     | 2022-05-08 | 02:00:39   | USA     | 192.168.178
.71  |       0 |
```