

Activity: Complete a SQL join

Scenario

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

1. Run the following query to retrieve all records from the machines table:

```
MariaDB [organization]> SELECT *
->
-> FROM machines;
```

device_id	operating_system	email_client	OS_patch_date	employee_id
a184b775c707	OS 1	Email Client 1	2021-09-01	1156
a192b174c940	OS 2	Email Client 1	2021-06-01	1052
a305b818c708	OS 3	Email Client 2	2021-06-01	1182
a317b635c465	OS 1	Email Client 2	2021-03-01	1130
a320b137c219	OS 2	Email Client 2	2021-03-01	1000

2. Complete the query to perform an **inner join** between the **machines** and **employees** table on the **device_id** column.

```
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-276
c116d593e558	OS 3	Email Client 1	2021-09-01	1002	1002	c116d593e558	tshah	Human Resources	North-434
d394e816f943	OS 3	Email Client 2	2021-03-01	1003	1003	d394e816f943	sgilmore	Finance	South-153
e218f877g788	OS 2	Email Client 1	2021-09-01	1004	1004	e218f877g788	eraab	Human Resources	South-127
f551g340h864	OS 3	Email Client 2	2021-12-01	1005	1005	f551g340h864			

Task 2. Return more data

1. Run the following SQL query to connect the **machines** and **employees** tables through a **left join**.

```
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	username	department	office
a320b137c219	OS 2	Email Client 2	2021-03-01	1000	1000	elarson	Marketing	East-170
b239c825d303	OS 1	Email Client 1	2021-03-01	1001	1001	bmoreno	Marketing	Central-276
c116d593e558	OS 3	Email Client 1	2021-09-01	1002	1002	tshah	Human Resources	North-434
d394e816f943	OS 3	Email Client 2	2021-03-01	1003	1003	sgilmore	Finance	South-153
e218f877g788	OS 2	Email Client 1	2021-09-01	1004	1004	eraab	Human Resources	South-127

2. Run the following SQL query to connect the **machines** and **employees** tables through a **right join**.

```
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	username	department	office
a320b137c219	OS 2	Email Client 2	2021-03-01	1000	1000	elarson	Marketing	East-170
b239c825d303	OS 1	Email Client 1	2021-03-01	1001	1001	bmoreno	Marketing	Central-276
c116d593e558	OS 3	Email Client 1	2021-09-01	1002	1002	tshah	Human Resources	North-434
d394e816f943	OS 3	Email Client 2	2021-03-01	1003	1003	sgilmore	Finance	South-153
e218f877g788	OS 2	Email Client 1	2021-09-01	1004	1004	eraab	Human Resources	South-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. To achieve this, you'll perform an inner join on the employees and log_in_attempts tables, linking them on the common **username** column.

- Run the following SQL query to perform an **inner join** on the **employees** and **log_in_attempts** tables

```
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	
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
1032	g773h303i639	jrafael	Information Technology	Central-309		
5	jrafael	2022-05-11	03:05:59	CANADA	192.168.86.232	0