

# Apply filters to SQL queries

## Project description

My organization is working to make their system more secure. The following steps provide examples of how I used SQL with filters to perform security-related tasks.

## Retrieve after-hours failed login attempts

There was a potential security incident that occurred after business hours. All after-hours login attempts that failed need to be investigated. The following code demonstrates how I created a SQL query to filter for failed login attempts that occurred after business hours.

```
MariaDB [organization]> SELECT *  
  -> FROM log_in_attempts  
  -> WHERE login_time > '18:00' AND success = FALSE;
```

event_id	username	login_date	login_time	country	ip_address	success
2	apatel	2022-05-10	20:27:27	CAN	192.168.205.12	0
18	pwashing	2022-05-11	19:28:50	US	192.168.66.142	0
20	tshah	2022-05-12	18:56:36	MEXICO	192.168.109.50	0

The first part of the code is my query, and the second part is a part of the output. This query filters for failed login attempts that happened after 18:00. I started by selecting all data from the `log_in_attempts` table. Then, I used a `WHERE` clause with an `AND` operator to filter my results to give me only failed login attempts that occurred after 18:00. The first condition is `login_time > '18:00'`, which filters for the login attempts that occurred after 18:00. The second condition is `success = FALSE`, which filters for the failed login attempts.

## Retrieve login attempts on specific dates

A suspicious event occurred on 2022-05-09. Any login activity that happened on 2022-05-09 or on the day before needs to be investigated. The following code demonstrates how I created a SQL query to filter for login attempts that occurred on this date.

```
MariaDB [organization]> SELECT *  
  -> FROM log_in_attempts  
  -> WHERE login_date = '2022-05-09' OR login_date = '2022-05-08';
```

event_id	username	login_date	login_time	country	ip_address	success
1	jrafael	2022-05-09	04:56:27	CAN	192.168.243.140	0
3	dkot	2022-05-09	06:47:41	USA	192.168.151.162	0
4	dkot	2022-05-08	02:00:39	USA	192.168.178.71	0

The first part of the screenshot is my query, and the second part is a part of the output. This query returns all login attempts that occurred on 2022-05-09 or 2022-05-08. I started by selecting all data from the `log_in_attempts` table. Then, I used a `WHERE` clause with an `OR` operator to filter my results to output only login attempts that occurred on either 2022-05-09 or 2022-05-08. The first condition is `login_date = '2022-05-09'`, which filters for logins on 2022-05-09. The second condition is `login_date = '2022-05-08'`, which filters for logins on 2022-05-08.

## Retrieve login attempts outside of Mexico

After investigating the organization's data on login attempts, I believe there is an issue with the login attempts that occurred outside of Mexico. The following code demonstrates how I created a SQL query to filter for login attempts that occurred outside of Mexico.

```
MariaDB [organization]> SELECT *
-> FROM log_in_attempts
-> WHERE NOT country LIKE 'MEX%';
```

event_id	username	login_date	login_time	country	ip_address	success
1	jrafael	2022-05-09	04:56:27	CAN	192.168.243.140	0
2	apatel	2022-05-10	20:27:27	CAN	192.168.205.12	0
3	dkot	2022-05-09	06:47:41	USA	192.168.151.162	0

The first part of the screenshot is my query, and the second part is a part of the output. This query returns all login attempts that occurred in countries other than Mexico. I started by selecting all data from the `log_in_attempts` table. Then, I used a `WHERE` clause with `NOT` to filter for countries other than Mexico. I used `LIKE` with `MEX%` as the pattern to match.

## Retrieve employees in Marketing

My team wants to update the computers for certain employees in the Marketing department. To do this, I have to get information on which employee machines to update. The following code demonstrates how I did this using an SQL Query.

```
MariaDB [organization]> SELECT *
-> FROM employees
-> WHERE department = 'Marketing' AND office LIKE 'East%';
```

employee_id	device_id	username	department	office
1000	a320b137c219	elarson	Marketing	East-170
1052	a192b174c940	jdarosa	Marketing	East-195
1075	x573y883z772	fbautist	Marketing	East-267

The first part of the screenshot is my query, and the second part is a part of the output. This query returns all employees in the Marketing department in the East building. First, I started by selecting all data from the employees table. Then, I used a WHERE clause with AND to filter for employees who work in the Marketing department and in the East building. I used LIKE with East% as the pattern to match. The first condition is the department = 'Marketing' portion, which filters for employees in the Marketing department. The second condition is the office LIKE 'East%' portion, which filters for employees in the East building.

## Retrieve employees in Finance or Sales

The machines for employees in the Finance and Sales departments also need to be updated. The following code demonstrates how I created a SQL query to filter for employee machines from employees in the Finance or Sales departments.

```
MariaDB [organization]> SELECT *  
-> FROM employees  
-> WHERE department = 'Finance' OR department = 'Sales';
```

employee_id	device_id	username	department	office
1003	d394e816f943	sgilmore	Finance	South-153
1007	h174i497j413	wjaffrey	Finance	North-406
1008	i858j583k571	abernard	Finance	South-170

The first part of the screenshot is my query, and the second part is a part of the output. This query returns all employees in the Finance and Sales departments. I started by selecting all data from the employees table. Then, I used a WHERE clause with OR to filter for employees who are in the Finance and Sales departments. I used the OR operator instead of AND because I want all employees who are in either department. The first condition is department = 'Finance', which filters for employees from the Finance department. The second condition is department = 'Sales', which filters for employees from the Sales department.

## Retrieve all employees not in IT

My team needs to make one more security update on employees who are not in the Information Technology department. The following demonstrates how I created a SQL query to filter for employee machines from employees not in the Information Technology department.

```

MariaDB [organization]> SELECT *
-> FROM employees
-> WHERE NOT department = 'Information Technology';
+-----+-----+-----+-----+-----+
| employee_id | device_id | username | department | office |
+-----+-----+-----+-----+-----+
|          1000 | a320b137c219 | elarson | Marketing | East-170 |
|          1001 | b239c825d303 | bmoreno | Marketing | Central-276 |
|          1002 | c116d593e558 | tshah | Human Resources | North-434 |

```

The first part of the screenshot is my query, and the second part is a part of the output. The query returns all employees not in the Information Technology department. First, I started by selecting all data from the `employees` table. Then, I used a `WHERE` clause with `NOT` to filter for employees not in this department.

## Summary

I applied filters to SQL queries to get specific information on login attempts and employee machines. I used two different tables, `log_in_attempts` and `employees`. I used the `AND`, `OR`, and `NOT` operators to filter for the specific information needed for each task. I also used `LIKE` and the percentage sign (%) wildcard to filter for patterns.