

Applying filters to SQL queries

Project Description

In this project, I investigated potential security issues related to login attempts and employee machine updates at a large organization. Using SQL, I retrieved and filtered data from the `log_in_attempts` and `employees` tables to identify suspicious activities and ensure that necessary updates were applied to employee machines in specific departments. The focus was on utilizing various SQL operators, including `AND`, `OR`, `NOT`, and `LIKE`, to efficiently query and analyze the data.

Retrieve After Hours Failed Login Attempts

The following code demonstrates how I created a SQL query to filter for failed login attempts that occurred after business hours.

SQL Query:

```
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

Explanation: The first part of the screenshot is my query, and the second part is a portion of the output. This query retrieves all login attempts from the `log_in_attempts` table that occurred after 18:00 and were marked as failed (indicated by `success = FALSE`). The condition `login_time > '18:00'` filters the records to include only those that happened after business hours, making it essential for identifying any suspicious after-hours activity.

Retrieve Login Attempts on Specific Dates

The following code demonstrates how I created a SQL query to filter for login attempts that occurred on specific dates.

SQL Query:

```
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

Explanation: The first part of the screenshot is my query, and the second part is a portion of the output. This query returns all login attempts that occurred on 2022-05-09 or 2022-05-08. First, 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

The following code demonstrates how I created a SQL query to filter for login attempts that occurred outside of Mexico.

SQL Query:

```
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

Explanation: The first part of the screenshot is my query, and the second part is a portion of the output. This query returns all login attempts that occurred in countries other than Mexico. First, 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 because the dataset represents Mexico as `MEX` and `MEXICO`. The percentage sign (%) represents any number of unspecified characters when used with `LIKE`.

Retrieve Employees in Marketing.

The following code demonstrates how I created a SQL query to filter for employee machines from employees in the Marketing department in the East building.

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

Explanation: The first part of the screenshot is my query, and the second part is a portion 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 because the data in the `office` column represents the East building with the specific office number. 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 following code demonstrates how I created a SQL query to filter for employee machines from employees in the Finance or Sales departments.

SQL Query:

```
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

Explanation: The first part of the screenshot is my query, and the second part is a portion of the output. This query returns all employees in the Finance and Sales departments. First, 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

The following demonstrates how I created a SQL query to filter for employee machines from employees not in the Information Technology department.

SQL Query:

```
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

Explanation: The first part of the screenshot is my query, and the second part is a portion 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.