Apply filters to SQL queries

Project description

My organization asked me to perform some security-related tasks. The following examples show how I used SQL queries to get desired information.

Retrieve after hours failed login attempts

There was a potential malicious activity that happened outside of the working hours (after 18:00). I used the following query to inspect that activity:

```
SELECT *
FROM log_in_attempts
WHERE login_time > '18:00' AND success = FALSE;
```

```
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 |
```

Retrieve login attempts on specific dates

The activity occurred on 2022-05-09. I created the following code to inspect login attempts that happened that day. I also investigated the activity that happened the day before.

```
SELECT *
FROM log_in_attempts
WHERE login_date = '2022-05-09' OR login_date = '2022-05-08';
```

```
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 |
```

Retrieve login attempts outside of Mexico

The login attempts from outside Mexico should also be investigated. Query:

```
SELECT *
FROM log_in_attempts
WHERE NOT country LIKE 'MEX%';
```

```
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 |
```

Retrieve employees in Marketing

I was also asked to filter Marketing Department employees computers, because of the upcoming update. The query should include machines that are located in the East Building. I used following code:

```
SELECT *
FROM employees
WHERE department = 'Marketing' AND office LIKE 'East%';
```

```
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 |
```

Retrieve employees in Finance or Sales

A different update needs to be made on machines in the Finance and Sales Department. Query:

```
SELECT *
FROM employees
WHERE department = 'Finance' OR department = 'Sales';
```

```
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   |
```

Retrieve all employees not in IT

Another update. Employees that work in different departments than IT.

```
SELECT *
FROM employees
WHERE NOT department = 'Information Technology';
```

```
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   |
```

Summary

To complete the tasks I worked with two different tables `log_in_attempts` and `employees`. The operators that I used are `AND`, `OR` and `NOT LIKE` and the `%` wildcard sign were also useful to filter for the patterns.