Apply filters to SQL queries

Project description

I will be examining data, specifically employees and log_in_attempts tables. I will be using SQL filters to retrieve records from different datasets and investigate the potential security issues.

Retrieve after hours failed login attempts

I was tasked with retrieving all the failed login attempts that occurred after hours. To retrieve these, I accessed all login attempts from the log_in_attempts column that occurred after 18:00 (or 6:00 pm) that had a success value of `0`*, which means it failed.*

```
MariaDB [organization]> SELECT *
    -> FROM log_in_attempts
    -> WHERE login_time > '18:00' AND success = '0';
+----------+----------+------------+------------+---------+-----------------+---------+
| 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 |
|       28 | aestrada | 2022-05-09 | 19:28:12   | MEXICO  | 192.168.27.57   |       0 |
|       34 | drosas   | 2022-05-11 | 21:02:04   | US      | 192.168.45.93   |       0 |
|       42 | cgriffin | 2022-05-09 | 23:04:05   | US      | 192.168.4.157   |       0 |
|       52 | cjackson | 2022-05-10 | 22:07:07   | CAN     | 192.168.58.57   |       0 |
|       69 | wjaffrey | 2022-05-11 | 19:55:15   | USA     | 192.168.100.17  |       0 |
|       82 | abernard | 2022-05-12 | 23:38:46   | MEX     | 192.168.234.49  |       0 |
|       87 | apatel   | 2022-05-08 | 22:38:31   | CANADA  | 192.168.132.153 |       0 |
|       96 | ivelasco | 2022-05-09 | 22:36:36   | CAN     | 192.168.84.194  |       0 |
|      104 | asundara | 2022-05-11 | 18:38:07   | US      | 192.168.96.200  |       0 |
|      107 | bisles   | 2022-05-12 | 20:25:57   | USA     | 192.168.116.187 |       0 |
|      111 | aestrada | 2022-05-10 | 22:00:26   | MEXICO  | 192.168.76.27   |       0 |
|      127 | abellmas | 2022-05-09 | 21:20:51   | CANADA  | 192.168.70.122  |       0 |
|      131 | bisles   | 2022-05-09 | 20:03:55   | US      | 192.168.113.171 |       0 |
|      155 | cgriffin | 2022-05-12 | 22:18:42   | USA     | 192.168.236.176 |       0 |
|      160 | jclark   | 2022-05-10 | 20:49:00   | CANADA  | 192.168.214.49  |       0 |
|      199 | yappiah  | 2022-05-11 | 19:34:48   | MEXICO  | 192.168.44.232  |       0 |
+----------+----------+------------+------------+---------+-----------------+---------+
```

The SQL command is `SELECT * FROM log_in_attempts WHERE login_time > '18:00' AND success = '0';` *The* `AND` *allows me to filter by two separate values to get the login attempts that I am looking for.*

Retrieve login attempts on specific dates

To retrieve the login attempts on two specific dates, I used a similar command as above. Instead of filtering by time and success, I filtered by 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 |       1 |
|        3 | dkot     | 2022-05-09 | 06:47:41   | USA     | 192.168.151.162 |       1 |
|        4 | dkot     | 2022-05-08 | 02:00:39   | USA     | 192.168.178.71  |       0 |
|        8 | bisles   | 2022-05-08 | 01:30:17   | US      | 192.168.119.173 |       0 |
|       12 | dkot     | 2022-05-08 | 09:11:34   | USA     | 192.168.100.158 |       1 |
|       15 | lyamamot | 2022-05-09 | 17:17:26   | USA     | 192.168.183.51  |       0 |
|       24 | arusso   | 2022-05-09 | 06:49:39   | MEXICO  | 192.168.171.192 |       1 |
|       25 | sbaelish | 2022-05-09 | 07:04:02   | US      | 192.168.33.137  |       1 |
|       26 | apatel   | 2022-05-08 | 17:27:00   | CANADA  | 192.168.123.105 |       1 |
```

The command is `SELECT * FROM log_in_attempts WHERE login_date = '2022-05-09' OR  login_date = '2022-05-08';` *This grabs logs from both dates, since the* `OR` *command will accept values that have either date.*

Retrieve login attempts outside of Mexico

To retrieve login attempts that occurred outside of Mexico, I need to get all attempts that happened `NOT` *in Mexico. Also, I need to handle the case of the country being listed as* `MEX` *or* `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 |       1 |
|        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 |       1 |
|        4 | dkot     | 2022-05-08 | 02:00:39   | USA     | 192.168.178.71  |       0 |
|        5 | jrafael  | 2022-05-11 | 03:05:59   | CANADA  | 192.168.86.232  |       0 |
|        7 | eraab    | 2022-05-11 | 01:45:14   | CAN     | 192.168.170.243 |       1 |
|        8 | bisles   | 2022-05-08 | 01:30:17   | US      | 192.168.119.173 |       0 |
|       10 | jrafael  | 2022-05-12 | 09:33:19   | CANADA  | 192.168.228.221 |       0 |
|       11 | sgilmore | 2022-05-11 | 10:16:29   | CANADA  | 192.168.140.81  |       0 |
|       12 | dkot     | 2022-05-08 | 09:11:34   | USA     | 192.168.100.158 |       1 |
|       13 | mrah     | 2022-05-11 | 09:29:34   | USA     | 192.168.246.135 |       1 |
```

The SQL command is `SELECT * FROM log_in_attempts WHERE NOT country LIKE 'MEX%';` *The* `NOT` *selects all countries that are not Mexico, so we can see all the login attempts from other countries, and the* `LIKE` *means that we can take out all versions of Mexico from the country column.*

Retrieve employees in Marketing

This task involves getting all Marketing employees from the East buildings. To do this, I filtered by department and office building. Using the `LIKE` *operator means that all East buildings will be considered.*

```
MariaDB [organization]> SELECT *
    -> FROM employees
    -> WHERE office LIKE 'East%' AND department = 'Marketing';
+-------------+--------------+------------+------------+-----------+
| 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  |
|        1088 | k8651965m233 | rgosh      | Marketing  | East-157  |
|        1103 | NULL         | randerss   | Marketing  | East-460  |
|        1156 | a184b775c707 | dellery    | Marketing  | East-417  |
|        1163 | h679i515j339 | cwilliam   | Marketing  | East-216  |
+-------------+--------------+------------+------------+-----------+
7 rows in set (0.229 sec)
```

The SQL command is `SELECT * FROM employees WHERE office LIKE 'East%' AND department = 'Marketing'`*; This will get employees who are in the Marketing department, and are in any of the East buildings.*

Retrieve employees in Finance or Sales

This command is similar to the last one, except that we change the departments to Finance and Sales, remove the office parameter, and use `OR` *to capture both of the departments.*

```
MariaDB [organization]> SELECT * FROM employees WHERE department = 'Sales' OR  department = 'Finance';
+-------------+--------------+------------+------------+------------+
| 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  |
|        1009 | NULL         | lrodriqu   | Sales      | South-134  |
|        1010 | k2421212m542 | jlansky    | Finance    | South-109  |
|        1011 | l748m120n401 | drosas     | Sales      | South-292  |
|        1015 | p611q262r945 | jsoto      | Finance    | North-271  |
|        1017 | r550s824t230 | jclark     | Finance    | North-188  |
|        1018 | s310t540u653 | abellmas   | Finance    | North-403  |
|        1022 | w237x430y567 | arusso     | Finance    | West-465   |
|        1024 | y976z753a267 | iuduike    | Sales      | South-215  |
|        1025 | z381a365b233 | jhill      | Sales      | North-115  |
```

The SQL command is `SELECT * FROM employees WHERE department = 'Sales' OR department = Finance;`

Retrieve all employees not in IT

This command is similar to the get all login attempts that are not from Mexico, but instead I am getting all employees that are not in Information Technology. Using the `NOT` *operator, SQL will return all the employees that are 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   |
|        1003 | d394e816f943 | sgilmore | Finance         | South-153   |
|        1004 | e218f877g788 | eraab    | Human Resources | South-127   |
|        1005 | f551g340h864 | gesparza | Human Resources | South-366   |
|        1007 | h174i497j413 | wjaffrey | Finance         | North-406   |
|        1008 | i858j583k571 | abernard | Finance         | South-170   |
|        1009 | NULL         | lrodriqu | Sales           | South-134   |
|        1010 | k2421212m542 | jlansky  | Finance         | South-109   |
|        1011 | l748m120n401 | drosas   | Sales           | South-292   |
|        1015 | p611q262r945 | jsoto    | Finance         | North-271   |
|        1016 | q793r736s288 | sbaelish | Human Resources | North-229   |
|        1017 | r550s824t230 | jclark   | Finance         | North-188   |
|        1018 | s310t540u653 | abellmas | Finance         | North-403   |
|        1020 | u899v381w363 | arutley  | Marketing       | South-351   |
|        1022 | w237x430y567 | arusso   | Finance         | West-465    |
|        1024 | y976z753a267 | iuduike  | Sales           | South-215   |
|        1025 | z381a365b233 | jhill    | Sales           | North-115   |
```

The command is The SQL command is `SELECT * FROM employees WHERE NOT department = 'Information Technology';`

Summary

This task required me to use various SQL commands and operators to obtain the correct tables from the database. This included properly using the `OR`*,* `NOT`*, and* `AND` *operators, along with the basic* `SELECT`*,* `FROM`*, and* `WHERE` *commands. I was able to get accurate results using my SQL queries and demonstrate how and why I used certain operators.*