Apply filters to SQL queries

Project description

I'm a security professional at a large organization. My job is to investigate issues and help keep the system secure. Recently I discovered some potential security issues involving login attempts and employee machines. My task is to examine the organizations data in their employees and log_in_attempts tables and retrieve records from different datasets and investigate the potential security threats.

Retrieve after hours failed login attempts

A potential security risk occurred after business hours. I need to investigate all the login failed attempts after 18:00 business hours.
The following code is the SQL Query I used to filter the information I needed to retrieve all the failed login attempts

```
    -> 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 |
+----------+----------+------------+------------+---------+-----------------+---------+
19 rows in set (0.181 sec)
```

I selected data from the `log_in_attempt` table then I used the clause `WHERE` for the `login_time` that was > then 18;00 , which would be after business was closed with the operator AND for column success with 0 = failed attempts and filtered the output I needed of failed attempts.This query filters for failed login attempts that occurred after 18:00

Retrieve login attempts on specific dates

A suspicious event occurred on 2022-05-09. I need to investigate this event by reviewing all login attempts on this day and the day before.

The following is the SQL Query I used to filter all login attempts for the specific dates.

```
laDB [organization]> SELECT *
-> FROM log_in_attempts
-> WHERE login_date = '2022-05-09' OR login_date = '2022-05-08';
+--------+----------+------------+------------+---------+-----------------+---------+
|ent_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 |
    28 | aestrada | 2022-05-09 | 19:28:12   | MEXICO  | 192.168.27.57   |       0 |
    30 | yappiah  | 2022-05-09 | 03:22:22   | MEX     | 192.168.124.48  |       1 |
    32 | acook    | 2022-05-09 | 02:52:02   | CANADA  | 192.168.142.239 |       0 |
    36 | asundara | 2022-05-08 | 09:00:42   | US      | 192.168.78.151  |       1 |
    38 | sbaelish | 2022-05-09 | 14:40:01   | USA     | 192.168.60.42   |       1 |
    39 | yappiah  | 2022-05-09 | 07:56:40   | MEXICO  | 192.168.57.115  |       1 |
    42 | cgriffin | 2022-05-09 | 23:04:05   | US      | 192.168.4.157   |       0 |
```

I selected data from the `log_in_attempt` table, then I used the clause `WHERE` for the login_date Column and the `OR` operator to filter the specific dates ‘2022-05-09’, ‘2022-05-08’. This Query gave an output of all logins from the dates from 2022-05-08 and 2022-05-09

Retrieve login attempts outside of Mexico

There’s been suspicious activity with login attempts , but the team has determined that this activity did not originate in Mexico. I need to investigate all logins that occurred outside of Mexico.

```
riaDB [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 |
|       14 | sbaelish | 2022-05-10 | 10:20:18   | US      | 192.168.16.99   |       1 |
|       15 | lyamamot | 2022-05-09 | 17:17:26   | USA     | 192.168.183.51  |       0 |
|       16 | mcouliba | 2022-05-11 | 06:44:22   | CAN     | 192.168.172.189 |       1 |
|       17 | pwashing | 2022-05-11 | 02:33:02   | USA     | 192.168.81.89   |       1 |
|       18 | pwashing | 2022-05-11 | 19:28:50   | US      | 192.168.66.142  |       0 |
|       19 | jhill    | 2022-05-12 | 13:09:04   | US      | 192.168.142.245 |       1 |
```

In the screenshot I created a SQL Query to retrieve all data from the `log_in_attempts` and used the `WHERE` clause with `NOT` to filter all the logins from country column except, and because the datasets use both MEX and MEXICO I used the `Like` and `%` sign to match both patterns. The Query output gave me all login attempts for all countries except for Mexico

Retrieve employees in Marketing

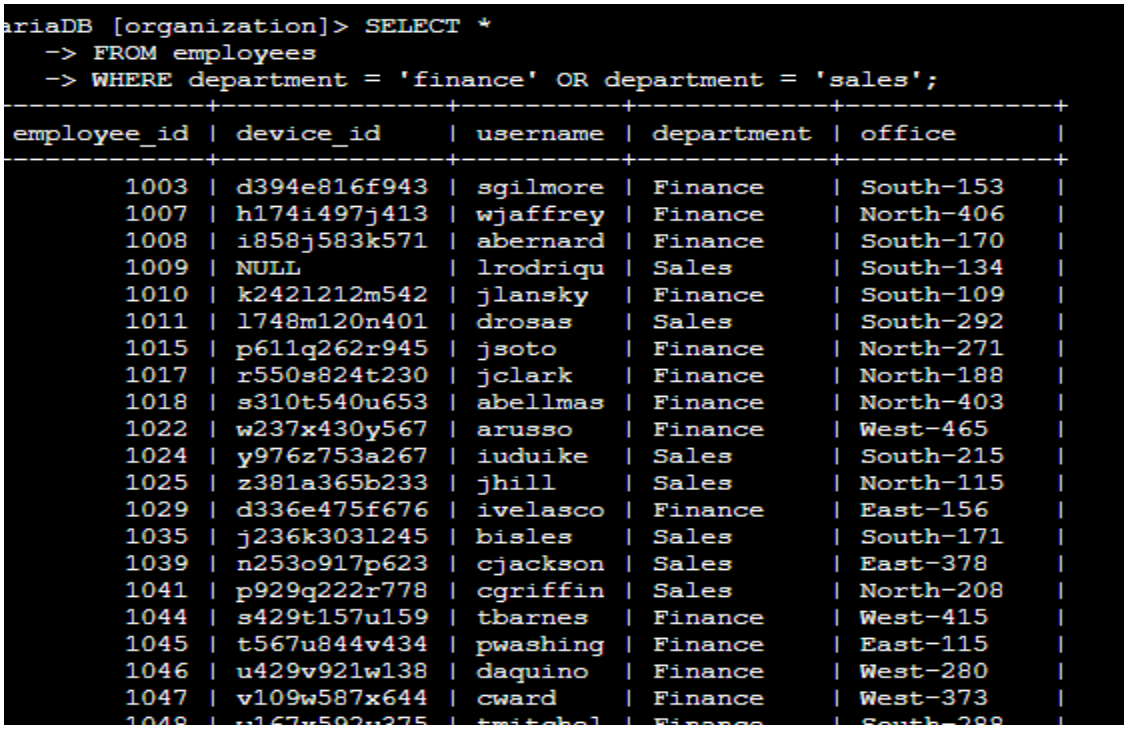
My team needs to perform security updates on specific employee machines in the Marketing Department. I'm responsible for getting information on these employee machines in the Marketing Department for all offices in the East building.

```
riaDB [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 |
|        1088 | k8651965m233 | rgosh    | Marketing  | East-157 |
|        1103 | NULL         | randerss | Marketing  | East-460 |
|        1156 | a184b775c707 | dellery  | Marketing  | East-417 |
|        1163 | h679i515j339 | cwilliam | Marketing  | East-216 |
+-------------+--------------+----------+------------+----------+
rows in set (0.001 sec)
```

To retrieve the information needed I used 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, and because the `office` column shows the East building and the North building with the specific office number I need to use the LIKE and % sign to give me all the East building only. 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.This query returns all employees in the Marketing department in the East building.

Retrieve employees in Finance or Sales

My team needs to perform a different security update on machines for employees in the Sales and Finance Departments.I'm responsible for getting this information.
The following Query shows how I retrieved all employees from the Finance and Sales Departments



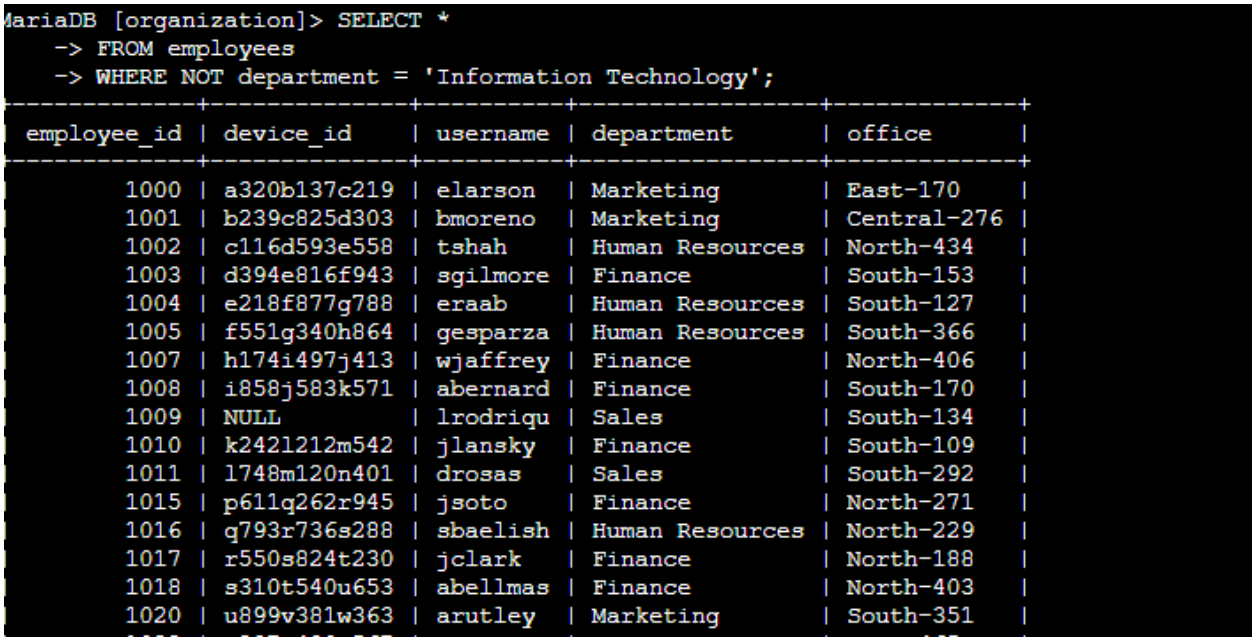
```
riaDB [organization]> SELECT *
   -> FROM employees
   -> WHERE department = 'finance' OR department = 'sales';
+-------------+--------------+----------+------------+-------------+
| employee_id | device_id    | username | department | office      |
+-------------+--------------+----------+------------+-------------+
|        1003 | d394e816f943 | sgilmore | Finance    | South-153   |
|        1007 | h174i497j413 | wjaffrey | Finance    | North-406   |
|        1008 | i858j583k571 | abernard | Finance    | South-170   |
|        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   |
|        1029 | d336e475f676 | ivelasco | Finance    | East-156    |
|        1035 | j236k3031245 | bisles   | Sales      | South-171   |
|        1039 | n253o917p623 | cjackson | Sales      | East-378    |
|        1041 | p929q222r778 | cgriffin | Sales      | North-208   |
|        1044 | s429t157u159 | tbarnes  | Finance    | West-415    |
|        1045 | t567u844v434 | pwashing | Finance    | East-115    |
|        1046 | u429v921w138 | daquino  | Finance    | West-280    |
|        1047 | v109w587x644 | cward    | Finance    | West-373    |
```

I used 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. Because I needed employees in the Sales or Finance Department I used`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.This query returns all employees in the Finance and Sales departments

Retrieve all employees not in IT

MY team needs to make one more update to employee machines in every department except the IT Department. I need to create a Query that will give me employee machines not in the IT 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   |
```

I used all the data from the `employees` table. Then, I used a `WHERE` clause with `NOT` to filter for employees not in the IT Department. `Where NOT department = 'Information Technology';`This query returns all employees not in the Information Technology department

Summary

I created SQL queries to get specific Information on login attempts and employee machines. I applied filters to two tables and used AND, OR, NOT, operators to filter specific machines and used LIKE and the % sign to filter for patterns.