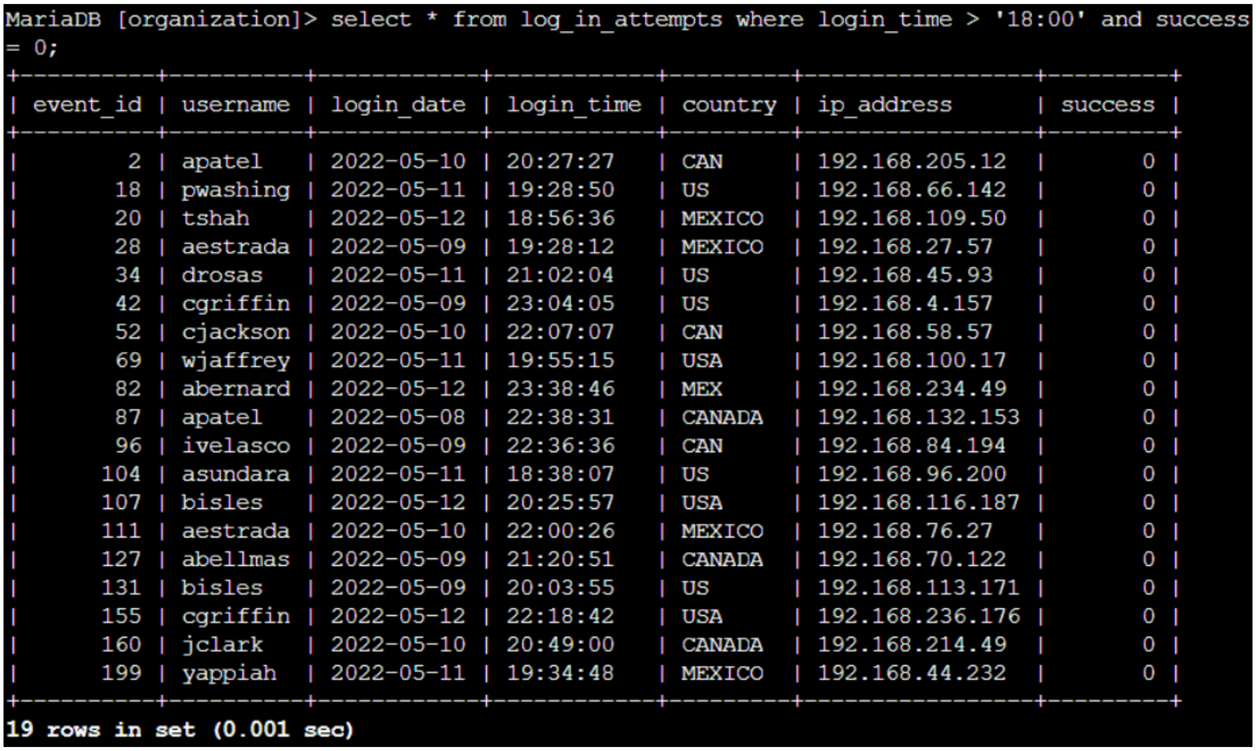
Apply filters to SQL queries

Project description

My organization has faced a security incident after business hours and the screenshots below demonstrate what I have accomplished using SQL queries.

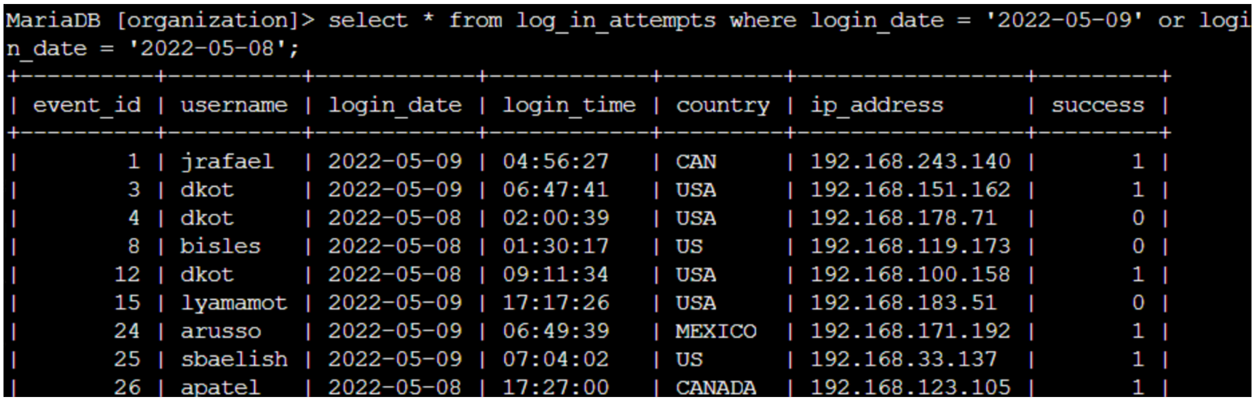
Retrieve after hours failed login attempts



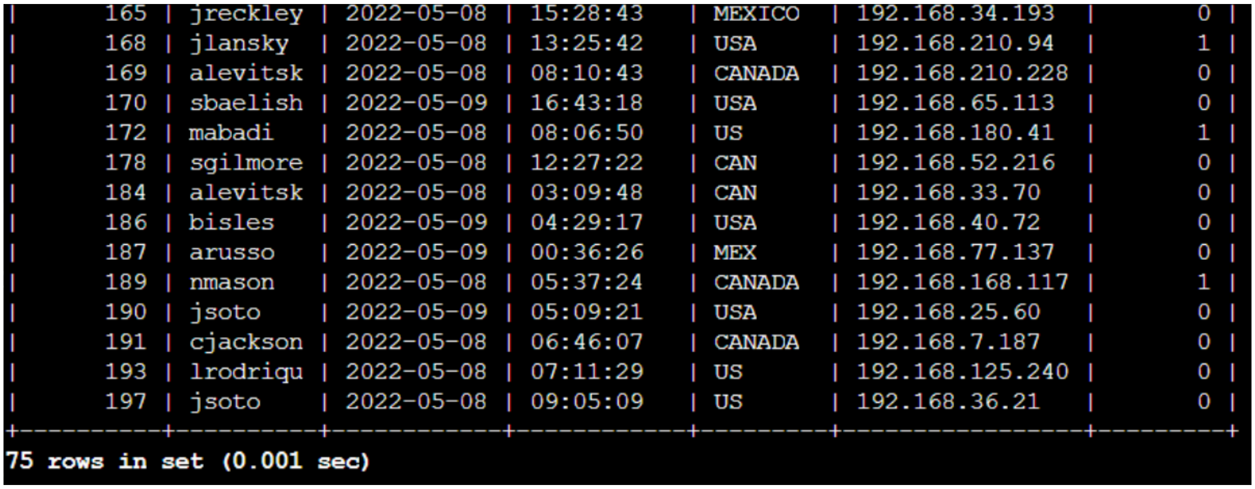
```
MariaDB [organization]> select * from log_in_attempts where login_time > '18:00' and success
= 0;
+----------+----------+------------+------------+---------+-----------------+---------+
| event_id | username | login_date | login_time | country | ip_address      | success |
+----------+----------+------------+------------+---------+-----------------+---------+
|        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 |
+----------+----------+------------+------------+---------+-----------------+---------+
19 rows in set (0.001 sec)
```

On this screenshot, I started by retrieving the failed login attempts after business hours. The command on the first line shows that I viewed all the columns of the log_in_attempts table when the login_time is after 18:00 where the success is 0, meaning failed login attempts. I used the '>' operator to indicate I am looking for hours after 18:00. The bottom line shows that there are 19 failed attempts that occurred after business hours.

Retrieve login attempts on specific dates



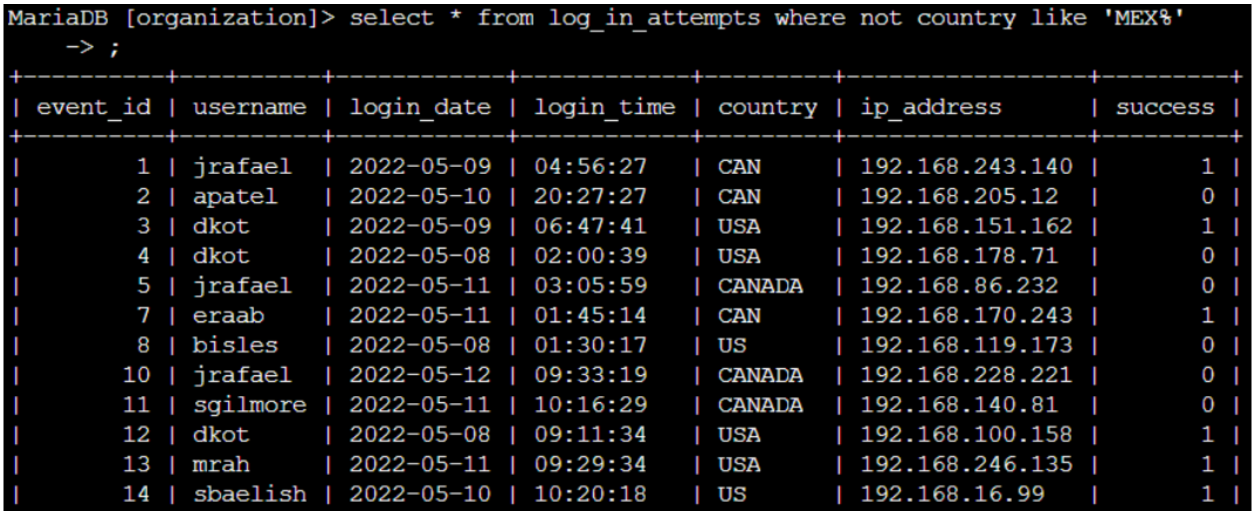
```
MariaDB [organization]> select * from log_in_attempts where login_date = '2022-05-09' or logi
n_date = '2022-05-08';
+----------+----------+------------+------------+---------+-----------------+---------+
| event_id | username | login_date | login_time | country | ip_address      | success |
+----------+----------+------------+------------+---------+-----------------+---------+
|        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 |
```



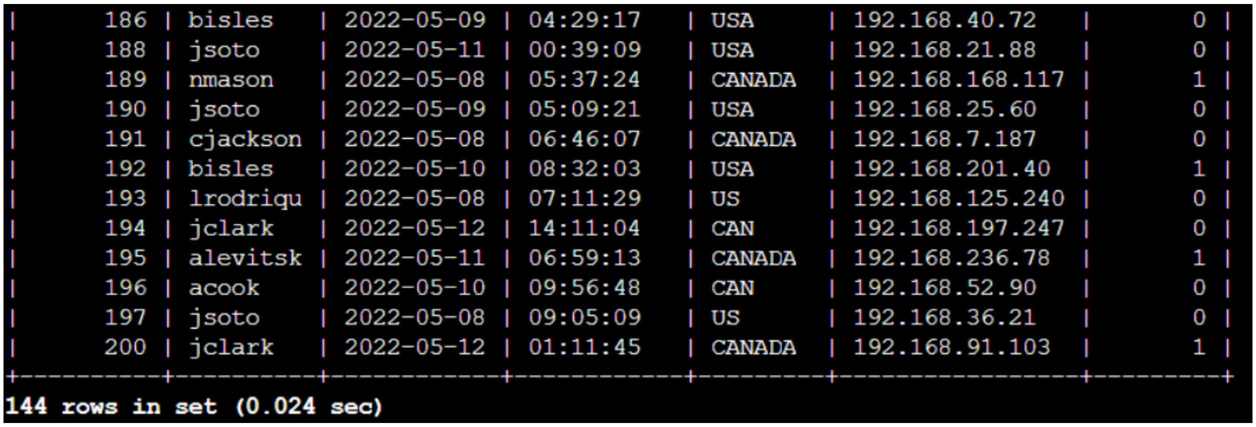
```
|      165 | jreckley | 2022-05-08 | 15:28:43   | MEXICO  | 192.168.34.193  |       0 |
|      168 | jlansky  | 2022-05-08 | 13:25:42   | USA     | 192.168.210.94  |       1 |
|      169 | alevitsk | 2022-05-08 | 08:10:43   | CANADA  | 192.168.210.228 |       0 |
|      170 | sbaelish | 2022-05-09 | 16:43:18   | USA     | 192.168.65.113  |       0 |
|      172 | mabadi   | 2022-05-08 | 08:06:50   | US      | 192.168.180.41  |       1 |
|      178 | sgilmore | 2022-05-08 | 12:27:22   | CAN     | 192.168.52.216  |       0 |
|      184 | alevitsk | 2022-05-08 | 03:09:48   | CAN     | 192.168.33.70   |       0 |
|      186 | bisles   | 2022-05-09 | 04:29:17   | USA     | 192.168.40.72   |       0 |
|      187 | arusso   | 2022-05-09 | 00:36:26   | MEX     | 192.168.77.137  |       0 |
|      189 | nmason   | 2022-05-08 | 05:37:24   | CANADA  | 192.168.168.117 |       1 |
|      190 | jsoto    | 2022-05-09 | 05:09:21   | USA     | 192.168.25.60   |       0 |
|      191 | cjackson | 2022-05-08 | 06:46:07   | CANADA  | 192.168.7.187   |       0 |
|      193 | lrodriqu | 2022-05-08 | 07:11:29   | US      | 192.168.125.240 |       0 |
|      197 | jsoto    | 2022-05-08 | 09:05:09   | US      | 192.168.36.21   |       0 |
+----------+----------+------------+------------+---------+-----------------+---------+
75 rows in set (0.001 sec)
```

My team has discovered that a suspicious event has occurred on 2022-05-09. On the screenshots above, I have identified all the login attempts that occurred between 2022-05-08 and 2022-05-09. There are 75 log in attempts that occurred between 2022-05-08 and 2022-05-09. I used ‘or’ keyword to filter out the respective dates.

Retrieve login attempts outside of Mexico



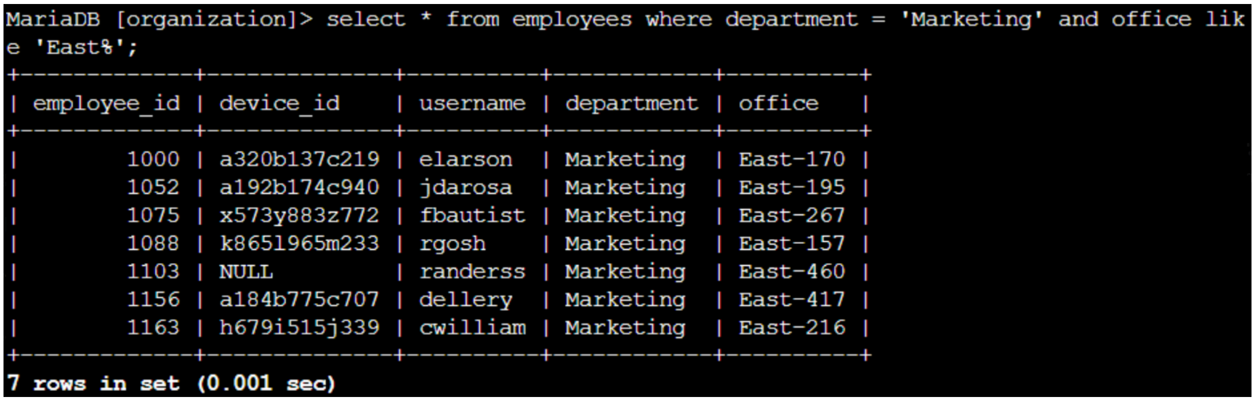
```
MariaDB [organization]> select * from log_in_attempts where not country like 'MEX%'
    -> ;
+----------+----------+------------+------------+---------+-----------------+---------+
| event_id | username | login_date | login_time | country | ip_address      | success |
+----------+----------+------------+------------+---------+-----------------+---------+
|        1 | jrafael  | 2022-05-09 | 04:56:27   | CAN     | 192.168.243.140 |       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 |
```



```
|      186 | bisles   | 2022-05-09 | 04:29:17   | USA     | 192.168.40.72   |       0 |
|      188 | jsoto    | 2022-05-11 | 00:39:09   | USA     | 192.168.21.88   |       0 |
|      189 | nmason   | 2022-05-08 | 05:37:24   | CANADA  | 192.168.168.117 |       1 |
|      190 | jsoto    | 2022-05-09 | 05:09:21   | USA     | 192.168.25.60   |       0 |
|      191 | cjackson | 2022-05-08 | 06:46:07   | CANADA  | 192.168.7.187   |       0 |
|      192 | bisles   | 2022-05-10 | 08:32:03   | USA     | 192.168.201.40  |       1 |
|      193 | lrodriqu | 2022-05-08 | 07:11:29   | US      | 192.168.125.240 |       0 |
|      194 | jclark   | 2022-05-12 | 14:11:04   | CAN     | 192.168.197.247 |       0 |
|      195 | alevitsk | 2022-05-11 | 06:59:13   | CANADA  | 192.168.236.78  |       1 |
|      196 | acook    | 2022-05-10 | 09:56:48   | CAN     | 192.168.52.90   |       0 |
|      197 | jsoto    | 2022-05-08 | 09:05:09   | US      | 192.168.36.21   |       0 |
|      200 | jclark   | 2022-05-12 | 01:11:45   | CANADA  | 192.168.91.103  |       1 |
+----------+----------+------------+------------+---------+-----------------+---------+
144 rows in set (0.024 sec)
```

My team has determined that the activity didn't originate in Mexico so I filtered out all the login attempts that are not from Mexico. I used ‘not' and ‘like' keywords to filter countries other than Mexico. There are 144 login attempts that are not in Mexico.

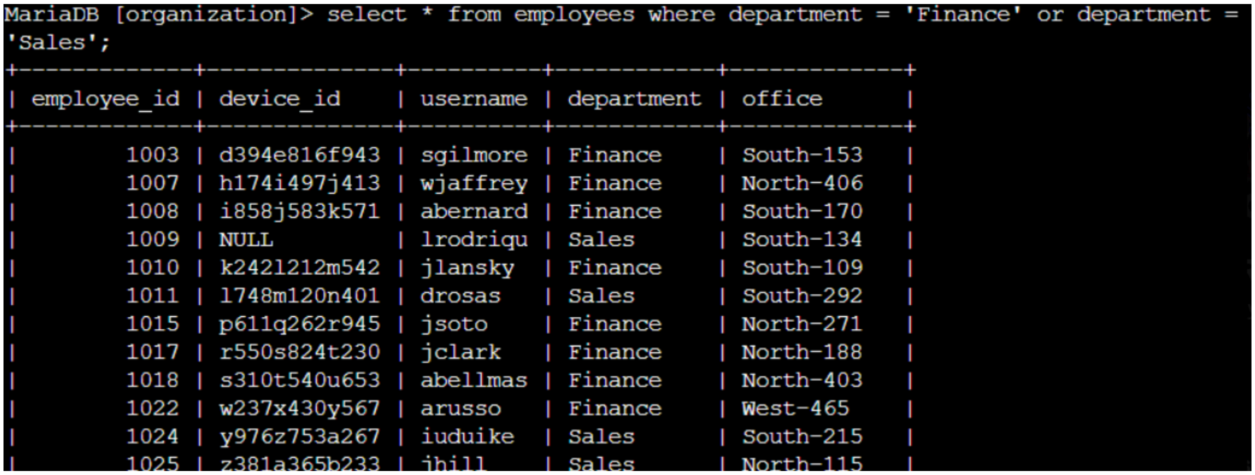
Retrieve employees in Marketing



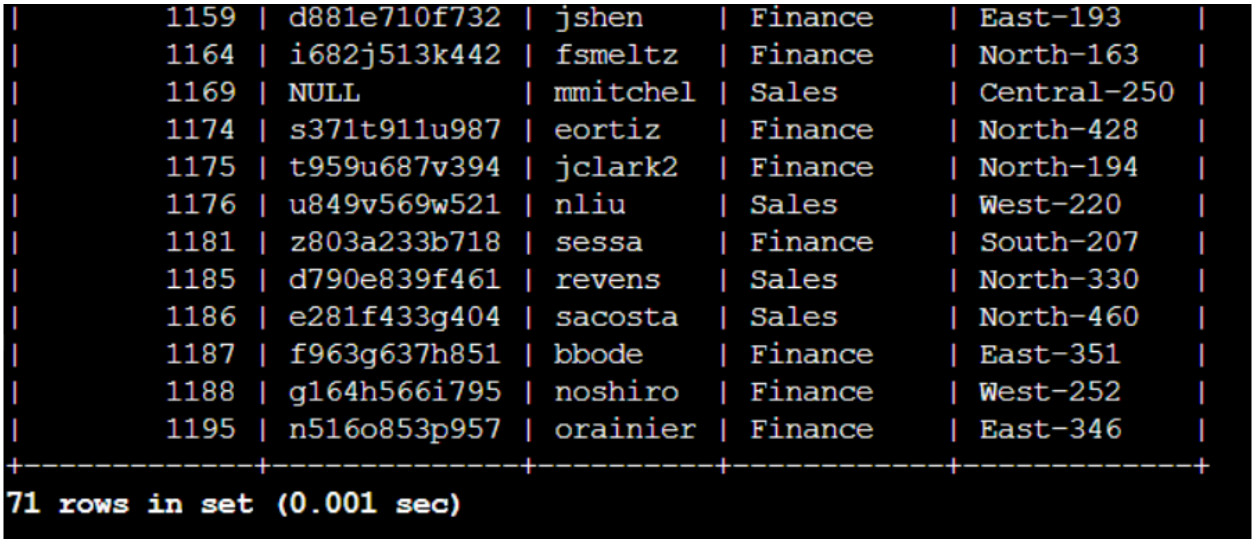
```
MariaDB [organization]> select * from employees where department = 'Marketing' and office lik
e 'East%';
+-------------+---------------+----------+------------+----------+
| employee_id | device_id     | username | department | office   |
+-------------+---------------+----------+------------+----------+
|        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 |
+-------------+---------------+----------+------------+----------+
7 rows in set (0.001 sec)
```

My team wanted to make security updates for employees in the East office who are in the Marketing department so I filtered them out. There are 7 people who are in the East office and are in the Marketing department.

Retrieve employees in Finance or Sales



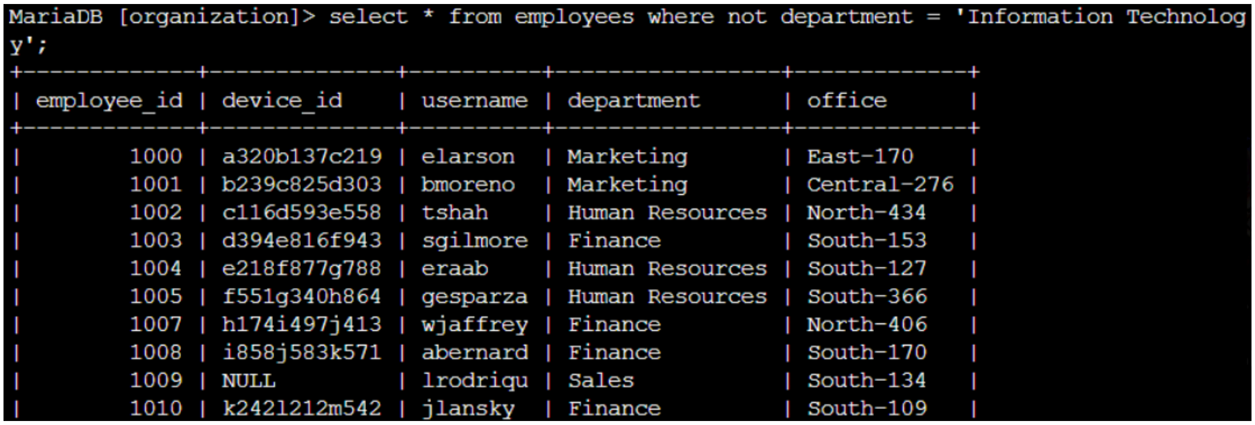
```
MariaDB [organization]> select * from employees where department = 'Finance' or department =
'Sales';
+-------------+--------------+----------+------------+-------------+
| employee_id | device_id    | username | department | office      |
+-------------+--------------+----------+------------+-------------+
|        1003 | d394e816f943 | sgilmore | Finance    | South-153   |
|        1007 | h174i497j413 | wjaffrey | Finance    | North-406   |
|        1008 | i858j583k571 | abernard | Finance    | South-170   |
|        1009 | NULL         | lrodriqu | Sales      | South-134   |
|        1010 | k2421212m542 | jlansky  | Finance    | South-109   |
|        1011 | 1748m120n401 | 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   |
```



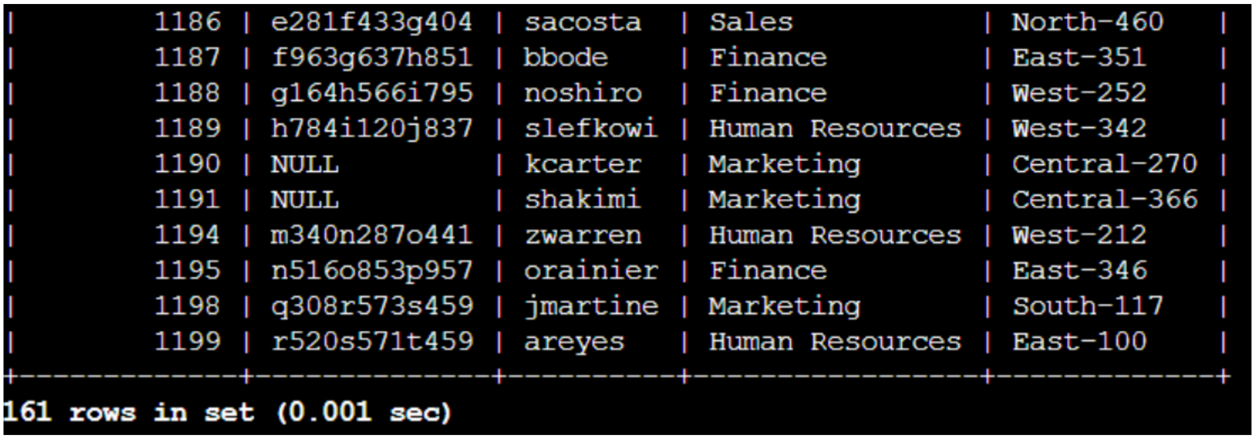
```
|        1159 | d881e710f732 | jshen    | Finance    | East-193    |
|        1164 | i682j513k442 | fsmeltz  | Finance    | North-163   |
|        1169 | NULL         | mmitchel | Sales      | Central-250 |
|        1174 | s371t911u987 | eortiz   | Finance    | North-428   |
|        1175 | t959u687v394 | jclark2  | Finance    | North-194   |
|        1176 | u849v569w521 | nliu     | Sales      | West-220    |
|        1181 | z803a233b718 | sessa    | Finance    | South-207   |
|        1185 | d790e839f461 | revens   | Sales      | North-330   |
|        1186 | e281f433g404 | sacosta  | Sales      | North-460   |
|        1187 | f963g637h851 | bbode    | Finance    | East-351    |
|        1188 | g164h566i795 | noshiro  | Finance    | West-252    |
|        1195 | n516o853p957 | orainier | Finance    | East-346    |
+-------------+--------------+----------+------------+-------------+
71 rows in set (0.001 sec)
```

My team wanted to build different security updates on the Finance and the Sales departments so I filtered them out using ‘or’ keyword. There are 71 people who are working in either the Finance or the Sales department.

Retrieve all employees not in IT



```
MariaDB [organization]> select * from employees where not department = 'Information Technolog
y';
+-------------+-------------+----------+-----------------+-------------+
| 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   |
```



```
|        1186 | e281f433g404 | sacosta  | Sales           | North-460   |
|        1187 | f963g637h851 | bbode    | Finance         | East-351    |
|        1188 | g164h566i795 | noshiro  | Finance         | West-252    |
|        1189 | h784i120j837 | slefkowi | Human Resources | West-342    |
|        1190 | NULL         | kcarter  | Marketing       | Central-270 |
|        1191 | NULL         | shakimi  | Marketing       | Central-366 |
|        1194 | m340n287o441 | zwarren  | Human Resources | West-212    |
|        1195 | n516o853p957 | orainier | Finance         | East-346    |
|        1198 | q308r573s459 | jmartine | Marketing       | South-117   |
|        1199 | r520s571t459 | areyes   | Human Resources | East-100    |
+-------------+--------------+----------+-----------------+-------------+
161 rows in set (0.001 sec)
```

Employees need one more update to their machine but employees in the Information Technology department already have this update so I filtered out all the employees except the Information Technology department.

Summary

I have filtered out and retrieved all the information necessary to maintain security using SQL query filtering and using keywords ‘and’, ‘or’, ‘not’ and ‘like’.