SQL Queries and Filters

Project description

This piece is meant to show basic skills in using SQL queries against a Google-provided database to pull data in relation to cybersecurity investigations. Each section of this piece requires knowledge of a different subset of the SQL query language and filters.

Each page shows the SQL queries I used to retrieve the data for each section are included (italicized above the screenshots) . The screenshots show my CLI query (highlighted in gray) as well as the results of the query. The final page is the database Table Format provided by Google for this exercise.

Retrieve after hours failed login attempts

Project Instructions: You recently discovered a potential security incident that occurred after business hours. To investigate this, you need to query the *log_in_attempts* table and review after hours login activity. Use filters in SQL to create a query that identifies all failed login attempts that occurred after 18:00.

SQL QUERY USED:
*SELECT * FROM log_in_attempts WHERE login_time > '18:00' AND success = false*

Fig. 1

```
MariaDB [organization]> clear
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 |
|       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 (0.065 sec)
```

Retrieve login attempts on specific dates

Project Instructions: A suspicious event occurred on 2022-05-09. To investigate this event, you want to review all login attempts which occurred on this day and the day before. Use filters in SQL to create a query that identifies all login attempts that occurred on 2022-05-09 or 2022-05-08.

SQL QUERY USED:
*SELECT * FROM log_in_attempts WHERE login_date = '2022-05-08' or login_date = '2022-05-09';*

Fig. 2 (results truncated for space)

```
MariaDB [organization]>
MariaDB [organization]> SELECT * FROM log_in_attempts WHERE login_date = '2022-05-08' or login_date = '2022-05-09';
+----------+----------+------------+------------+---------+-----------------+---------+
| 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 |
|       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 |
|       43 | mcouliba | 2022-05-08 | 02:35:34   | CANADA  | 192.168.16.208  |       0 |
|       44 | daquino  | 2022-05-08 | 07:02:35   | CANADA  | 192.168.168.144 |       0 |
|       47 | dkot     | 2022-05-08 | 05:06:45   | US      | 192.168.233.24  |       1 |
|       49 | asundara | 2022-05-08 | 14:00:01   | US      | 192.168.173.213 |       0 |
|       53 | nmason   | 2022-05-08 | 11:51:38   | CAN     | 192.168.133.188 |       1 |
|       56 | acook    | 2022-05-08 | 04:56:30   | CAN     | 192.168.209.130 |       1 |
|       58 | ivelasco | 2022-05-09 | 17:20:54   | CAN     | 192.168.57.162  |       0 |
|       61 | dtanaka  | 2022-05-09 | 09:45:18   | USA     | 192.168.98.221  |       1 |
|       65 | aalonso  | 2022-05-09 | 23:42:12   | MEX     | 192.168.52.37   |       1 |
|       66 | aestrada | 2022-05-08 | 21:58:32   | MEX     | 192.168.67.223  |       1 |
|       67 | abernard | 2022-05-09 | 11:53:41   | MEX     | 192.168.118.29  |       1 |
|       68 | mrah     | 2022-05-08 | 17:16:13   | US      | 192.168.42.248  |       1 |
|       70 | tmitchel | 2022-05-09 | 10:55:17   | MEXICO  | 192.168.87.199  |       1 |
|       71 | mcouliba | 2022-05-09 | 06:57:42   | CAN     | 192.168.55.169  |       0 |
|       72 | alevitsk | 2022-05-08 | 12:09:10   | CANADA  | 192.168.139.176 |       1 |
|       79 | abernard | 2022-05-09 | 11:41:15   | MEX     | 192.168.158.170 |       0 |
|       80 | cjackson | 2022-05-08 | 02:18:10   | CANADA  | 192.168.33.140  |       1 |
```

Retrieve login attempts outside of Mexico

Project Instructions: There's been suspicious activity with login attempts, but the team has determined that this activity didn't originate in Mexico. Now, you need to investigate login attempts that occurred outside of Mexico. Use filters in SQL to create a query that identifies all login attempts that occurred outside of Mexico.

SQL QUERY USED:
*SELECT * FROM log_in_attempts WHERE country NOT LIKE 'MEX%';*

Fig. 3 (Results truncated for space)

```
MariaDB [organization]>
MariaDB [organization]> SELECT * FROM log_in_attempts WHERE country NOT 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 |
|       21 | iuduike  | 2022-05-11 | 17:50:00   | US      | 192.168.131.147 |       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 |
|       29 | bisles   | 2022-05-11 | 01:21:22   | US      | 192.168.85.186  |       0 |
|       31 | acook    | 2022-05-12 | 17:36:45   | CANADA  | 192.168.58.232  |       0 |
|       32 | acook    | 2022-05-09 | 02:52:02   | CANADA  | 192.168.142.239 |       0 |
|       33 | zbernal  | 2022-05-11 | 02:52:10   | US      | 192.168.72.59   |       1 |
|       34 | drosas   | 2022-05-11 | 21:02:04   | US      | 192.168.45.93   |       0 |
|       36 | asundara | 2022-05-08 | 09:00:42   | US      | 192.168.78.151  |       1 |
|       37 | eraab    | 2022-05-10 | 06:03:41   | CANADA  | 192.168.152.148 |       0 |
|       38 | sbaelish | 2022-05-09 | 14:40:01   | USA     | 192.168.60.42   |       1 |
|       41 | apatel   | 2022-05-10 | 17:39:42   | CANADA  | 192.168.46.207  |       0 |
|       42 | cgriffin | 2022-05-09 | 23:04:05   | US      | 192.168.4.157   |       0 |
|       43 | mcouliba | 2022-05-08 | 02:35:34   | CANADA  | 192.168.16.208  |       0 |
|       44 | daquino  | 2022-05-08 | 07:02:35   | CANADA  | 192.168.168.144 |       0 |
|       45 | dtanaka  | 2022-05-11 | 10:28:54   | US      | 192.168.223.157 |       1 |
|       46 | eraab    | 2022-05-11 | 11:29:27   | CAN     | 192.168.24.12   |       0 |
|       47 | dkot     | 2022-05-08 | 05:06:45   | US      | 192.168.233.24  |       1 |
|       48 | asundara | 2022-05-11 | 03:18:45   | USA     | 192.168.72.10   |       1 |
|       49 | asundara | 2022-05-08 | 14:00:01   | US      | 192.168.173.213 |       0 |
|       50 | jclark   | 2022-05-10 | 10:48:02   | CANADA  | 192.168.174.117 |       0 |
|       51 | jrafael  | 2022-05-10 | 22:40:01   | CANADA  | 192.168.148.115 |       1 |
```

Retrieve employees in Marketing

Project Instructions: Your team wants to perform security updates on specific employee machines in the Marketing department. You're responsible for getting information on these employee machines and will need to query the *employees* table. Use filters in SQL to create a query that identifies all employees in the Marketing department for all offices in the East building.

SQL QUERY USED:
*SELECT * FROM employees WHERE department = 'Marketing' AND office LIKE 'East%';*

Fig. 4

```
MariaDB [organization]>
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 |
|        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 (0.021 sec)

MariaDB [organization]>
```

Retrieve employees in Finance or Sales

Project Instructions: Your team now needs to perform a different security update on machines for employees in the Sales and Finance departments. Use filters in SQL to create a query that identifies all employees in the Sales or Finance departments.

SQL QUERY USED:
*SELECT * FROM employees WHERE department = 'Sales' OR department = 'Finance';*

Fig 5 (Results truncated for space)

```
MariaDB [organization]>
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 | k242l212m542 | 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    |
|        1048 | w167x592y375 | tmitchel | Finance    | South-288   |
|        1049 | NULL         | jreckley | Finance    | Central-295 |
|        1050 | y132z930a114 | csimmons | Finance    | North-468   |
|        1057 | f370g535h632 | mscott   | Sales      | South-270   |
|        1062 | k3671639m697 | redwards | Finance    | North-180   |
|        1063 | l686m140n569 | lpope    | Sales      | East-226    |
|        1066 | o678p794q957 | ttyrell  | Sales      | Central-444 |
|        1069 | NULL         | jpark    | Finance    | East-110    |
|        1071 | t244u829v723 | zdutchma | Sales      | West-348    |
|        1072 | u905v920w694 | esmith   | Sales      | East-421    |
|        1076 | y347z204a710 | fgarcia  | Finance    | Central-270 |
|        1078 | a667b270c984 | sharley  | Sales      | North-418   |
|        1081 | d647e310f618 | qcorbit  | Finance    | South-290   |
|        1083 | f840g812h544 | gkoshi   | Finance    | West-165    |
|        1085 | h339i498j269 | cperez   | Sales      | East-325    |
|        1086 | i281j129k749 | lmajumda | Sales      | West-499    |
|        1089 | l358m929n154 | jpark2   | Sales      | West-251    |
|        1091 | n378o313p469 | rtran    | Sales      | Central-230 |
|        1092 | o391p779q935 | lpark    | Sales      | West-227    |
|        1098 | u671v146w618 | tarchamb | Sales      | North-423   |
|        1099 | v283w690x104 | anaser   | Finance    | West-357    |
|        1105 | b551c837d758 | kmei     | Finance    | Central-232 |
|        1107 | d168e758f876 | akajwara | Sales      | North-471   |
|        1109 | f229g533h679 | nlocklea | Sales      | East-196    |
|        1110 | g567h376i314 | pchaudhu | Sales      | Central-428 |
|        1111 | h835i179j862 | jlee     | Sales      | West-309    |
|        1116 | m272n572o874 | nzhao    | Sales      | South-100   |
|        1117 | n683o758p820 | dahmad   | Sales      | West-405    |
|        1118 | o305p208q337 | jpark3   | Sales      | South-329   |
|        1119 | p164q780r999 | omubarak | Sales      | West-409    |
|        1121 | r628s557t397 | mrojas   | Sales      | East-288    |
|        1122 | s103t952u851 | btorres  | Finance    | West-319    |
|        1130 | a317b635c465 | tsnow    | Sales      | Central-451 |
```

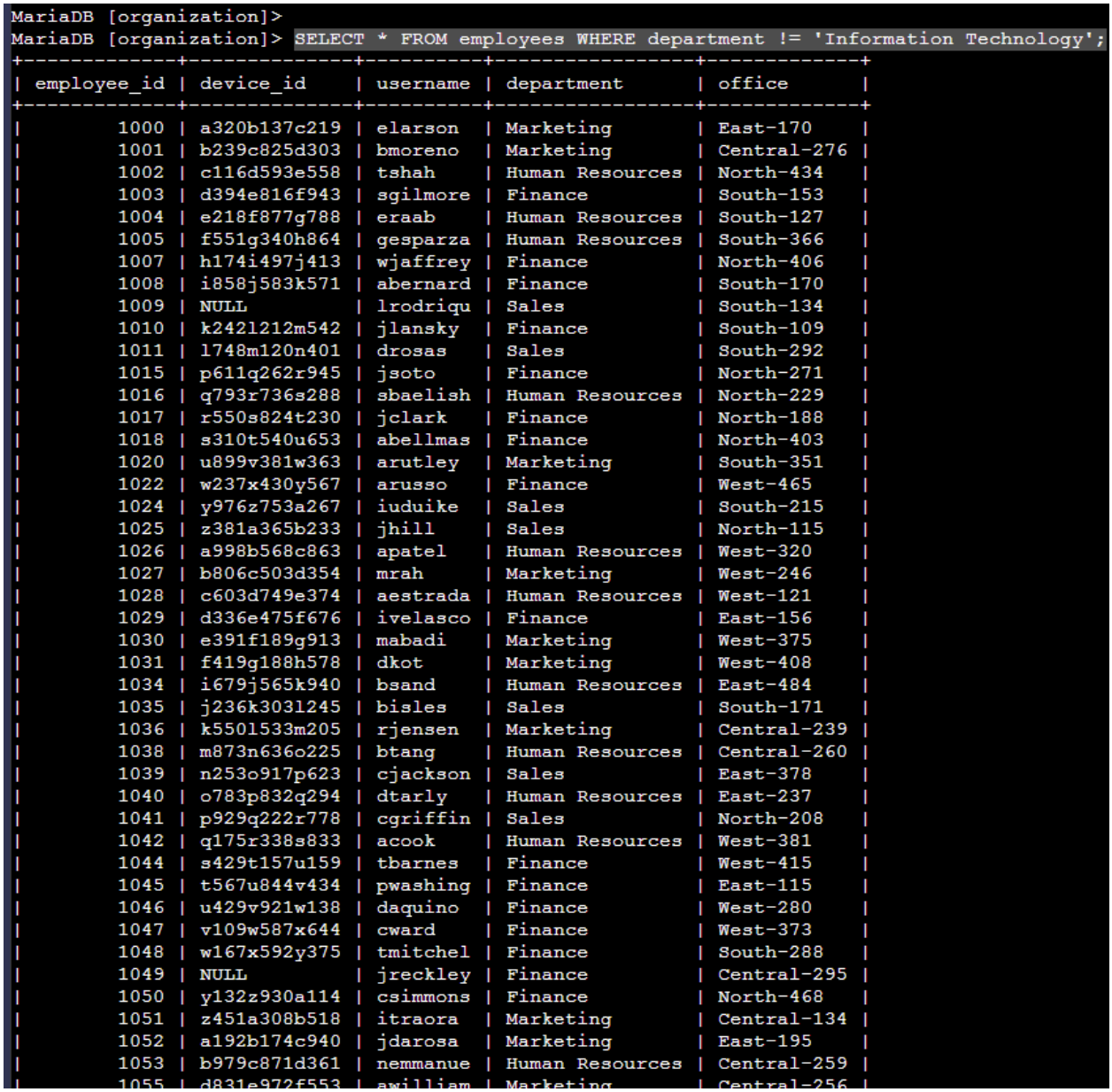
Retrieve all employees not in IT

Project Instructions: Your team needs to make one more update to employee machines. The employees who are in the Information Technology department already had this update, but employees in all other departments need it. Use filters in SQL to create a query which identifies all employees not in the IT department.

SQL QUERY USED:

*SELECT * FROM employees WHERE department != 'Information Technology';*

Fig. 6 (Results truncated for space)



```
MariaDB [organization]>
MariaDB [organization]> SELECT * FROM employees WHERE 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   |
|        1026 | a998b568c863 | apatel   | Human Resources | West-320    |
|        1027 | b806c503d354 | mrah     | Marketing       | West-246    |
|        1028 | c603d749e374 | aestrada | Human Resources | West-121    |
|        1029 | d336e475f676 | ivelasco | Finance         | East-156    |
|        1030 | e391f189g913 | mabadi   | Marketing       | West-375    |
|        1031 | f419g188h578 | dkot     | Marketing       | West-408    |
|        1034 | i679j565k940 | bsand    | Human Resources | East-484    |
|        1035 | j236k3031245 | bisles   | Sales           | South-171   |
|        1036 | k5501533m205 | rjensen  | Marketing       | Central-239 |
|        1038 | m873n636o225 | btang    | Human Resources | Central-260 |
|        1039 | n253o917p623 | cjackson | Sales           | East-378    |
|        1040 | o783p832q294 | dtarly   | Human Resources | East-237    |
|        1041 | p929q222r778 | cgriffin | Sales           | North-208   |
|        1042 | q175r338s833 | acook    | Human Resources | West-381    |
|        1044 | s429t157u159 | tbarnes  | Finance         | West-415    |
|        1045 | t567u844v434 | pwashing | Finance         | East-115    |
|        1046 | u429v921w138 | daquino  | Finance         | West-280    |
|        1047 | v109w587x644 | cward    | Finance         | West-373    |
|        1048 | w167x592y375 | tmitchel | Finance         | South-288   |
|        1049 | NULL         | jreckley | Finance         | Central-295 |
|        1050 | y132z930a114 | csimmons | Finance         | North-468   |
|        1051 | z451a308b518 | itraora  | Marketing       | Central-134 |
|        1052 | a192b174c940 | jdarosa  | Marketing       | East-195    |
|        1053 | b979c871d361 | nemmanue | Human Resources | Central-259 |
|        1055 | d831e972f553 | awilliam | Marketing       | Central-256 |
```

Table Formats

This document describes how the tables used for this portfolio activity are organized. The `organization` database contains the following two tables:

- `log_in_attempts`
- `employees`

log_in_attempts

The `log_in_attempts` table has the following columns:

- `event_id`: The identification number assigned to each login event
- `username`: The username of the employee
- `login_date`: The date the login attempt was recorded
- `login_time`: The time the login attempt was recorded
- `country`: The country where the login attempt occurred
- `ip_address`: The IP address of that employee's machine
- `success`: The success of the login attempt; `FALSE` indicates a failed attempt

In the MariaDB shell, these columns are returned as:

```
+----------+----------+------------+------------+---------+-----------------+---------+
| event_id | username | login_date | login_time | country | ip_address      | success |
+----------+----------+------------+------------+---------+-----------------+---------+
```

employees

The `employees` table has the following columns:

- `employee_id`: The identification number assigned to each employee
- `device_id`: The identification number assigned to each device used by the employee
- `username`: The username of the employee
- `department`: The department the employee is in
- `office`: The office the employee is located in

In the MariaDB shell, these columns are returned as:

```
+-------------+--------------+----------+------------------------+-------------+
| employee_id | device_id    | username | department             | office      |
+-------------+--------------+----------+------------------------+-------------+
```