SQL Queries on a Database

Project description

This simulation project puts the performer, **Maheswar Reddy Avula**, into the position of a system administrator for an organization. Responsibilities include using SQL queries to a retrieve information from a database to determine which employee devices must be updated, and also investigate user login activity to explore if any unusual activity has occurred.

(for readability and simplicity, the outputs have been limited to table entries out of 200)

Retrieving employee device data

Direction: The admin must obtain information on employee devices because the team needs to update them. The information needed is in the machines table in the organization database.

First, the entire table is viewed. The **select** command was used to query data **from** the table **machines** as follows:

```
MariaDB [organization]> select * from machines;
+--------------+------------------+----------------+---------------+-------------+
| device_id    | operating_system | email_client   | OS_patch_date | employee_id |
+--------------+------------------+----------------+---------------+-------------+
| a184b775c707 | OS 1             | Email Client 1 | 2021-09-01    |        1156 |
| a192b174c940 | OS 2             | Email Client 1 | 2021-06-01    |        1052 |
| a305b818c708 | OS 3             | Email Client 2 | 2021-06-01    |        1182 |
| a317b635c465 | OS 1             | Email Client 2 | 2021-03-01    |        1130 |
| a320b137c219 | OS 2             | Email Client 2 | 2021-03-01    |        1000 |
| a398b471c573 | OS 3             | Email Client 2 | 2021-12-01    |           0 |
| a667b270c984 | OS 1             | Email Client 1 | 2021-03-01    |        1078 |
| a821b452c176 | OS 2             | Email Client 2 | 2021-12-01    |        1104 |
| a998b568c863 | OS 3             | Email Client 1 | 2021-12-01    |        1026 |
```

Second, focus is put on the email clients used by the various devices. This is done by the following query:

```
MariaDB [organization]> select device_id, email_client from machines;
+--------------+----------------+
| device_id    | email_client   |
+--------------+----------------+
| a184b775c707 | Email Client 1 |
| a192b174c940 | Email Client 1 |
| a305b818c708 | Email Client 2 |
| a317b635c465 | Email Client 2 |
| a320b137c219 | Email Client 2 |
| a398b471c573 | Email Client 2 |
| a667b270c984 | Email Client 1 |
```

Information was then needed on the operating systems used on various devices and their last patch date. This information was displayed using the following query:

```
MariaDB [organization]> select device_id, operating_system, OS_patch_date from machin
es;
+--------------+-----------------+---------------+
| device_id    | operating_system | OS_patch_date |
+--------------+-----------------+---------------+
| a184b775c707 | OS 1            | 2021-09-01    |
| a192b174c940 | OS 2            | 2021-06-01    |
| a305b818c708 | OS 3            | 2021-06-01    |
| a317b635c465 | OS 1            | 2021-03-01    |
| a320b137c219 | OS 2            | 2021-03-01    |
| a398b471c573 | OS 3            | 2021-12-01    |
| a667b270c984 | OS 1            | 2021-03-01    |
```

Investigating login activity

Direction: The admin must analyze the information from the log_in_attempts table to determine if any unusual activity has occurred.

First, an investigation was done regarding the locations where login attempts were made to ensure that they were in expected areas(the United Stated, Canada, or Mexico).

```
MariaDB [organization]> select event_id, country from log_in_attempts;
+----------+---------+
| event_id | country |
+----------+---------+
|        1 | CAN     |
|        2 | CAN     |
|        3 | USA     |
|        4 | USA     |
|        5 | CANADA  |
|        6 | MEXICO  |
|        7 | CAN     |
```

Secondly, it needed to be checked if login attempts were made outside of the organization's working hours. To accomplish this, the following query was made:

```
MariaDB [organization]> select username, login_date, login_time from log_in_attempts;
+----------+------------+------------+
| username | login_date | login_time |
+----------+------------+------------+
| jrafael  | 2022-05-09 | 04:56:27   |
| apatel   | 2022-05-10 | 20:27:27   |
| dkot     | 2022-05-09 | 06:47:41   |
| dkot     | 2022-05-08 | 02:00:39   |
| jrafael  | 2022-05-11 | 03:05:59   |
| arutley  | 2022-05-12 | 17:00:59   |
| eraab    | 2022-05-11 | 01:45:14   |
```

Lastly, a complete picture of all login attempts was required. The following query was made to accomplish this task:

```
MariaDB [organization]> select * from log_in_attempts;
+----------+----------+------------+------------+---------+----------------+---------
-+
| 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
```

Ordering login attempts data

Direction: The admin must sequence the data that the previous query returned according to the login date and time.

First, the information must be arranged by the login date. The **order by** keyword applied to **login_date** was used the **select** query to get the required result as follows:

```
MariaDB [organization]> select * from log_in_attempts order by login_date;
+----------+----------+------------+------------+---------+----------------+---------
-+
| event_id | username | login_date | login_time | country | ip_address     | success
 |
+----------+----------+------------+------------+---------+----------------+---------
-+
|      145 | ivelasco | 2022-05-08 | 09:06:02   | CANADA  | 192.168.39.196 |       1
 |
|      163 | tmitchel | 2022-05-08 | 09:21:16   | MEX     | 192.168.119.29 |       0
 |
|       36 | asundara | 2022-05-08 | 09:00:42   | US      | 192.168.78.151 |       1
 |
|      165 | jreckley | 2022-05-08 | 15:28:43   | MEXICO  | 192.168.34.193 |       0
```

Secondly, the results were further needed to be organized by **login_time**. The order by keyword applied to **login_date**, **login_time** was used with the **select** query to get the required result as follows:

```
MariaDB [organization]> select * from log_in_attempts order by login_date, login_time
;
+----------+----------+------------+------------+---------+-----------------+--------
-+
| event_id | username | login_date | login_time | country | ip_address      | success
 |
+----------+----------+------------+------------+---------+-----------------+--------
-+
|      117 | bsand    | 2022-05-08 | 00:19:11   | USA     | 192.168.197.187 |       0
 |
|       92 | pwashing | 2022-05-08 | 00:36:12   | US      | 192.168.247.219 |       0
 |
|        8 | bisles   | 2022-05-08 | 01:30:17   | US      | 192.168.119.173 |       0
 |
```

Summary

Queries were accurately made using **select**, **from** keywords and **order by** operator to get the desired results. All tasks were successfully completed in accordance with the directions given by the organization.