Task 1. Retrieve login attempts after a certain date

In this task, you need to investigate a recent security incident. To do this, you need to gather information about login attempts made after a certain date.

1. Complete the SQL query to retrieve data for login attempts made after `'2022-05-09'`. Replace X with the correct operator:

The correct query to solve this step:

```
SELECT * FROM
log_in_attempts
WHERE login_date > '2022-05-09';
```

```
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 41
Server version: 10.3.39-MariaDB-0+deb10u1 Debian 10

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [organization]> clear
MariaDB [organization]> SELECT * FROM
    ->
    -> log_in_attempts
    ->
    -> WHERE login_date > '2022-05-09';
+----------+----------+------------+------------+---------+-----------------+---------+
| 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 |
|        5 | jrafael  | 2022-05-11 | 03:05:59   | CANADA  | 192.168.86.232  |       0 |
|        6 | arutley  | 2022-05-12 | 17:00:59   | MEXICO  | 192.168.3.24    |       0 |
|        7 | eraab    | 2022-05-11 | 01:45:14   | CAN     | 192.168.170.243 |       1 |
|        9 | yappiah  | 2022-05-11 | 13:47:29   | MEX     | 192.168.59.136  |       1 |
|       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 |
|       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 |
|       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 |
|       20 | tshah    | 2022-05-12 | 18:56:36   | MEXICO  | 192.168.109.50  |       0 |
|       21 | iuduike  | 2022-05-11 | 17:50:00   | US      | 192.168.131.147 |       1 |
|       22 | rjensen  | 2022-05-11 | 00:59:26   | MEX     | 192.168.213.128 |       0 |
|       23 | yappiah  | 2022-05-10 | 18:11:53   | MEXICO  | 192.168.200.48  |       1 |
```

Now, based on your first query, you find a need to expand the date range to include 2022-05-09 in your search.

2. Complete the SQL query to retrieve data for login attempts that were made on or after `'2022-05-09'`. Replace X with the correct operator:

The correct query to solve this step:

```sql
SELECT *
FROM log_in_attempts
WHERE login_date >= '2022-05-09';
```

```
MariaDB [organization]> SELECT * FROM
    ->
    -> log_in_attempts
    ->
    -> WHERE login_date > '2022-05-09';
+----------+----------+------------+------------+---------+------------------+---------+
| 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 |
|        5 | jrafael  | 2022-05-11 | 03:05:59   | CANADA  | 192.168.86.232   |       0 |
|        6 | arutley  | 2022-05-12 | 17:00:59   | MEXICO  | 192.168.3.24     |       0 |
|        7 | eraab    | 2022-05-11 | 01:45:14   | CAN     | 192.168.170.243  |       1 |
|        9 | yappiah  | 2022-05-11 | 13:47:29   | MEX     | 192.168.59.136   |       1 |
|       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 |
|       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 |
|       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 |
|       20 | tshah    | 2022-05-12 | 18:56:36   | MEXICO  | 192.168.109.50   |       0 |
|       21 | iuduike  | 2022-05-11 | 17:50:00   | US      | 192.168.131.147  |       1 |
|       22 | rjensen  | 2022-05-11 | 00:59:26   | MEX     | 192.168.213.128  |       0 |
|       23 | yappiah  | 2022-05-10 | 18:11:53   | MEXICO  | 192.168.200.48   |       1 |
|       27 | aalonso  | 2022-05-10 | 01:55:35   | MEX     | 192.168.103.210  |       0 |
|       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 |
|       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 |
|       35 | tshah    | 2022-05-10 | 15:26:08   | MEX     | 192.168.92.147   |       0 |
|       37 | eraab    | 2022-05-10 | 06:03:41   | CANADA  | 192.168.152.148  |       0 |
```

Task 2. Retrieve logins in a date range

In this task, you need to narrow the focus of the search. Login attempts made after 2022-05-11 shouldn't be included. Use the `BETWEEN` and `AND` operators to return results between `'2022-05-09'` and `'2022-05-11'`.

- Run the query to retrieve the required records. You must insert the required dates X and Y:

The correct query to solve this step:

```sql
SELECT *
FROM log_in_attempts
WHERE login_date BETWEEN '2022-05-09' AND '2022-05-11';
```

```
MariaDB [organization]> SELECT *
    ->
    -> FROM log_in_attempts
    ->
    -> WHERE login_date BETWEEN '2022-05-09' AND '2022-05-11';
+----------+----------+------------+------------+---------+------------------+---------+
| 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 |
|        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 |
|        9 | yappiah  | 2022-05-11 | 13:47:29   | MEX     | 192.168.59.136   |       1 |
|       11 | sgilmore | 2022-05-11 | 10:16:29   | CANADA  | 192.168.140.81   |       0 |
|       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 |
|       21 | iuduike  | 2022-05-11 | 17:50:00   | US      | 192.168.131.147  |       1 |
|       22 | rjensen  | 2022-05-11 | 00:59:26   | MEX     | 192.168.213.128  |       0 |
|       23 | yappiah  | 2022-05-10 | 18:11:53   | MEXICO  | 192.168.200.48   |       1 |
|       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 |
|       27 | aalonso  | 2022-05-10 | 01:55:35   | MEX     | 192.168.103.210  |       0 |
|       28 | aestrada | 2022-05-09 | 19:28:12   | MEXICO  | 192.168.27.57    |       0 |
|       29 | bisles   | 2022-05-11 | 01:21:22   | US      | 192.168.85.186   |       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 |
|       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 |
```

Task 3. Investigate logins at certain times

In this task, you need to investigate logins that were made at certain times. To do this, filter the data in the `log_in_attempts` table by login time (`login_time`).

First, your organization's typical work hours begin at 07:00:00. Retrieve all login attempts made before 07:00:00 to learn more about the users who are logging in outside of typical hours.

1. Write a SQL query to retrieve data for login attempts made before `'07:00:00'`.

Note: Place time data in single quotation marks.
The correct query to solve this step:

```
SELECT *
FROM log_in_attempts
WHERE login_time < '07:00:00';
```

```
MariaDB [organization]> SELECT *
    ->
    -> FROM log_in_attempts
    ->
    -> WHERE login_time < '07:00:00';
+----------+----------+------------+------------+---------+-----------------+---------+
| 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 |
|        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 |
|       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 |
|       22 | rjensen  | 2022-05-11 | 00:59:26   | MEX     | 192.168.213.128 |       0 |
|       24 | arusso   | 2022-05-09 | 06:49:39   | MEXICO  | 192.168.171.192 |       1 |
|       27 | aalonso  | 2022-05-10 | 01:55:35   | MEX     | 192.168.103.210 |       0 |
|       29 | bisles   | 2022-05-11 | 01:21:22   | US      | 192.168.85.186  |       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 |
|       33 | zbernal  | 2022-05-11 | 02:52:10   | US      | 192.168.72.59   |       1 |
|       37 | eraab    | 2022-05-10 | 06:03:41   | CANADA  | 192.168.152.148 |       0 |
|       43 | mcouliba | 2022-05-08 | 02:35:34   | CANADA  | 192.168.16.208  |       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 |
|       55 | jlansky  | 2022-05-11 | 05:15:34   | US      | 192.168.6.170   |       0 |
|       56 | acook    | 2022-05-08 | 04:56:30   | CAN     | 192.168.209.130 |       1 |
|       59 | rjensen  | 2022-05-12 | 04:52:08   | MEX     | 192.168.54.140  |       0 |
|       71 | mcouliba | 2022-05-09 | 06:57:42   | CAN     | 192.168.55.169  |       0 |
|       75 | zbernal  | 2022-05-12 | 04:14:35   | US      | 192.168.188.63  |       1 |
|       78 | smartell | 2022-05-10 | 05:55:53   | MEX     | 192.168.41.88   |       0 |
```

The query in the previous step returned more results than required.

2. Modify the query to return logins between `'06:00:00'` and `'07:00:00'`.

The correct query to solve this step:

```
SELECT *

FROM log_in_attempts

WHERE login_time BETWEEN '06:00:00' AND '07:00:00';
```

```
MariaDB [organization]> SELECT *
    ->
    -> FROM log_in_attempts
    ->
    -> WHERE login_time BETWEEN '06:00:00' AND '07:00:00';
+----------+----------+------------+------------+---------+------------------+---------+
| event_id | username | login_date | login_time | country | ip_address       | success |
+----------+----------+------------+------------+---------+------------------+---------+
|        3 | dkot     | 2022-05-09 | 06:47:41   | USA     | 192.168.151.162  |       1 |
|       16 | mcouliba | 2022-05-11 | 06:44:22   | CAN     | 192.168.172.189  |       1 |
|       24 | arusso   | 2022-05-09 | 06:49:39   | MEXICO  | 192.168.171.192  |       1 |
|       37 | eraab    | 2022-05-10 | 06:03:41   | CANADA  | 192.168.152.148  |       0 |
|       71 | mcouliba | 2022-05-09 | 06:57:42   | CAN     | 192.168.55.169   |       0 |
|       98 | gesparza | 2022-05-11 | 06:30:14   | CANADA  | 192.168.148.80   |       0 |
|      106 | tmitchel | 2022-05-12 | 06:15:41   | MEXICO  | 192.168.3.252    |       1 |
|      134 | iuduike  | 2022-05-09 | 06:46:40   | USA     | 192.168.22.115   |       1 |
|      136 | mabadi   | 2022-05-10 | 06:56:44   | US      | 192.168.214.234  |       1 |
|      142 | gesparza | 2022-05-11 | 06:31:14   | CANADA  | 192.168.117.56   |       1 |
|      147 | yappiah  | 2022-05-08 | 06:04:34   | MEX     | 192.168.65.245   |       0 |
|      148 | daquino  | 2022-05-08 | 06:15:55   | CANADA  | 192.168.135.6    |       1 |
|      182 | lyamamot | 2022-05-10 | 06:01:31   | USA     | 192.168.106.52   |       0 |
|      191 | cjackson | 2022-05-08 | 06:46:07   | CANADA  | 192.168.7.187    |       0 |
|      195 | alevitsk | 2022-05-11 | 06:59:13   | CANADA  | 192.168.236.78   |       1 |
+----------+----------+------------+------------+---------+------------------+---------+
15 rows in set (0.001 sec)

MariaDB [organization]>
```

Task 4. Investigate logins by event ID

In this task, you need to investigate login attempts based on event ID numbers. With this query, you want to return only the `event_id`, `username`, and `login_date` fields from the `log_in_attempts` table.

Note: The `event_id` column contains numeric data; do not place numeric data in quotation marks.

1. Write a query to return login attempts with `event_id` greater than or equal to `100`.

The correct query to solve this step:

```sql
SELECT event_id, username, login_date

FROM log_in_attempts

WHERE event_id >= 100;
```

```
MariaDB [organization]> SELECT event_id, username, login_date
    ->
    -> FROM log_in_attempts
    ->
    -> WHERE event_id >= 100;
+----------+----------+------------+
| event_id | username | login_date |
+----------+----------+------------+
|      100 | tmitchel | 2022-05-12 |
|      101 | sbaelish | 2022-05-08 |
|      102 | jreckley | 2022-05-09 |
|      103 | jhill    | 2022-05-11 |
|      104 | asundara | 2022-05-11 |
|      105 | cjackson | 2022-05-12 |
|      106 | tmitchel | 2022-05-12 |
|      107 | bisles   | 2022-05-12 |
|      108 | daquino  | 2022-05-09 |
|      109 | mcouliba | 2022-05-10 |
|      110 | mabadi   | 2022-05-09 |
|      111 | aestrada | 2022-05-10 |
|      112 | rjensen  | 2022-05-09 |
|      113 | gesparza | 2022-05-10 |
|      114 | smartell | 2022-05-10 |
|      115 | ivelasco | 2022-05-10 |
|      116 | tmitchel | 2022-05-10 |
|      117 | bsand    | 2022-05-08 |
|      118 | smartell | 2022-05-12 |
|      119 | tmitchel | 2022-05-11 |
|      120 | tmitchel | 2022-05-09 |
|      121 | btang    | 2022-05-10 |
|      122 | yappiah  | 2022-05-11 |
|      123 | bmoreno  | 2022-05-10 |
```

The query in the previous step returned more data than required.

2. Modify the query to return only login attempts with `event_id` between `100` and `150`.

The correct query to solve this step:

```sql
SELECT event_id, username, login_date

FROM log_in_attempts

WHERE event_id BETWEEN 100 AND 150;
```

```
MariaDB [organization]> SELECT event_id, username, login_date
    ->
    -> FROM log_in_attempts
    ->
    -> WHERE event_id BETWEEN 100 AND 150;
+----------+----------+------------+
| event_id | username | login_date |
+----------+----------+------------+
|      100 | tmitchel | 2022-05-12 |
|      101 | sbaelish | 2022-05-08 |
|      102 | jreckley | 2022-05-09 |
|      103 | jhill    | 2022-05-11 |
|      104 | asundara | 2022-05-11 |
|      105 | cjackson | 2022-05-12 |
|      106 | tmitchel | 2022-05-12 |
|      107 | bisles   | 2022-05-12 |
|      108 | daquino  | 2022-05-09 |
|      109 | mcouliba | 2022-05-10 |
|      110 | mabadi   | 2022-05-09 |
|      111 | aestrada | 2022-05-10 |
|      112 | rjensen  | 2022-05-09 |
|      113 | gesparza | 2022-05-10 |
|      114 | smartell | 2022-05-10 |
|      115 | ivelasco | 2022-05-10 |
|      116 | tmitchel | 2022-05-10 |
|      117 | bsand    | 2022-05-08 |
|      118 | smartell | 2022-05-12 |
|      119 | tmitchel | 2022-05-11 |
|      120 | tmitchel | 2022-05-09 |
|      121 | btang    | 2022-05-10 |
|      122 | yappiah  | 2022-05-11 |
|      123 | bmoreno  | 2022-05-10 |
|      124 | asundara | 2022-05-12 |
```