

Apply filters to SQL queries

Project description

You are a security professional at a large organization. Part of your job is to investigate security issues to help keep the system secure. You recently discovered some potential security issues that involve login attempts and employee machines.

Your task is to examine the organization's data in their **employees** and **log_in_attempts** tables. You'll need to use SQL filters to retrieve records from different datasets and investigate the potential security issues.

Retrieve after hours failed login attempts

Team is examining failed login attempts that occurred outside of regular business hours. To do this, you need to extract data from the **log_in_attempts** table, focusing on all unsuccessful login attempts made after 6:00 PM (18:00).

In this table:

- The **login_time** column records the time each login attempt was made.
- Business hours end at 18:00.
- The **success** column uses Boolean values, where **1** represents a successful attempt (TRUE) and **0** represents a failed attempt (FALSE).

I'll filter for records where the login time is after 18:00 and the success value is 0.

```

MariaDB [organization]> clear
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)

```

Retrieve login attempts on specific dates

Team is investigating a suspicious event that took place on **2022-05-09**. To support the investigation, you need to retrieve all login attempts from the `log_in_attempts` table that occurred on **2022-05-09** and the **previous day (2022-05-08)**.

The `login_date` column in the table stores the date of each login attempt, which you'll use to filter records for these two specific dates.

```
SELECT *
```

```
FROM log_in_attempts
```

```
WHERE login_date = '2022-05-08' AND login_date = '2022-05-09';
```

MariaDB [organization]> SELECT * FROM log_in_attempts WHERE login_date = '2022-05-09' OR login_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
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	mrh	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
102	jreckley	2022-05-09	16:51:44	MEX	192.168.108.13	1
108	daquino	2022-05-09	21:30:48	CANADA	192.168.15.110	1
110	mabadi	2022-05-09	00:01:54	USA	192.168.90.124	1
112	rjensen	2022-05-09	09:22:05	MEX	192.168.69.116	1
117	bsand	2022-05-08	00:19:11	USA	192.168.197.187	0
120	tmitchel	2022-05-09	02:58:17	MEXICO	192.168.134.62	0
127	abellmas	2022-05-09	21:20:51	CANADA	192.168.70.122	0
128	jclark	2022-05-09	10:45:59	CANADA	192.168.122.169	0
131	bisles	2022-05-09	20:03:55	US	192.168.113.171	0
134	iuduike	2022-05-09	06:46:40	USA	192.168.22.115	1
135	bsand	2022-05-09	14:06:33	US	192.168.91.238	0
144	daquino	2022-05-09	11:09:32	CANADA	192.168.139.9	0
145	ivelasco	2022-05-08	09:06:02	CANADA	192.168.39.196	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
150	nmason	2022-05-08	14:40:02	CAN	192.168.204.124	0
151	mabadi	2022-05-09	16:29:46	USA	192.168.30.225	1
158	smartell	2022-05-09	19:30:32	MEXICO	192.168.190.178	1
161	abellmas	2022-05-09	13:25:50	CAN	192.168.180.205	0
162	yappiah	2022-05-09	04:51:22	MEXICO	192.168.162.100	0
163	tmitchel	2022-05-08	09:21:16	MEX	192.168.119.29	0
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)

Retrieve login attempts outside of Mexico

Your team is currently investigating login attempts that did **not** originate from Mexico. The `country` field in the `log_in_attempts` table contains values like `'MEX'` and `'MEXICO'`. To filter out these entries, you should use the `NOT` and `LIKE` operators with the pattern `'MEX%'`, which will exclude all records where the country name begins with `'MEX'`.

```
SELECT *
```

```
FROM log_in_attempts
```

```
WHERE NOT country LIKE 'MEX%';
```

```
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	mrhah	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	iuduik	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

178	sgilmore	2022-05-08	12:27:22	CAN	192.168.92.218	0
179	jclark	2022-05-12	04:08:17	CAN	192.168.232.93	0
181	abellmas	2022-05-10	13:37:05	CAN	192.168.60.111	0
182	lyamamot	2022-05-10	06:01:31	USA	192.168.106.52	0
183	nmason	2022-05-11	05:29:36	CANADA	192.168.137.147	0
184	alevitsk	2022-05-08	03:09:48	CAN	192.168.33.70	0
185	jsoto	2022-05-10	13:34:58	USA	192.168.151.91	0
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 (0.002 sec)

Retrieve employees in Marketing

For tasks 4, 5, and 6, you will retrieve the required information from the **employees** table, specifically using the **department** and **office** columns to filter and extract the relevant data.

```
SELECT *
```

```
FROM employees
```

```
WHERE department = 'Marketing' AND office LIKE 'East%';
```

```
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	k865l965m233	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)

Retrieve employees in Finance or Sales

Your team now needs to carry out a separate update on the computers of all employees who work in either the **Finance** or **Sales** department. To do this, you need to retrieve information about these employees.

SELECT *

FROM employees

WHERE department = 'Finance' OR department = 'Sales';

```
MariaDB [organization]> clear
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	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
1142	m674n127o823	lsilva	Finance	East-440
1144	NULL	erobinso	Finance	Central-266
1147	r454s225t299	tvega	Finance	West-177
1148	s328t505u907	dharvey	Finance	South-181
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 (0.000 sec)
```

Retrieve all employees not in IT

Your team needs to perform one final update. This update has already been applied to employee computers in the **Information Technology** department. Now, the team needs information on employees who are **not** part of that department. To identify these employees, use the **NOT** operator in your query.

SELECT *

FROM employees

WHERE NOT department = 'Information Technology';

```
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	k242l212m542	jlansky	Finance	South-109
1011	l748m120n401	drosas	Sales	South-292
1015	p611q262r945	jsoto	Finance	North-271
1016	q793r736s288	sbaelish	Human Resources	North-229

1185	d790e839f461	revens	Sales	North-330
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)
```

Summary

The tasks involve retrieving and filtering login and employee data based on specific conditions. This includes identifying failed login attempts after business hours using the `login_time` and `success` columns, retrieving login attempts from the days surrounding a suspicious event using the `login_date`, and filtering out logins from Mexico using the `country` column with `NOT LIKE 'MEX%'`. Additionally, tasks require using the `department` and `office` columns from the `employees` table to find employees in Finance or Sales, and to exclude those in the Information Technology department using the `NOT` operator.