

Apply filters to SQL queries

Project description

The purpose of this project is to examine the organization's data in their `employees` and `log_in_attempts` tables. We will need to use SQL filters to retrieve records from different datasets and investigate the potential security issues.

Retrieve after hours failed login attempts

This query identifies all failed login attempts after 6:00 PM (18:00)

```
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

This query identifies all login attempts that occurred on 2022-05-09 or 2022-05-08. This is to investigate a suspicious event that occurred on 2022-05-09.

```
MariaDB [organization]> SELECT *
-> FROM log_in_attempts
-> WHERE login_date = '2022-05-09' OR '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
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
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
8	bisles	2022-05-08	01:30:17	US	192.168.119.173	0
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
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
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
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
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
198	yappiah	2022-05-12	10:37:22	MEXICO	192.168.103.106	1
199	yappiah	2022-05-11	19:34:48	MEXICO	192.168.44.232	0
200	jclark	2022-05-12	01:11:45	CANADA	192.168.91.103	1

200 rows in set, 5 warnings (0.021 sec)

Retrieve login attempts outside of Mexico

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.

We will use filters in SQL to create a query that identifies all login attempts that occurred outside of Mexico.

The dataset contains values titled 'MEX' and 'MEXICO' that refer to Mexico in the country column. To include both values, we will use the LIKE keyword in the query. We will also use the NOT keyword to exclude them.

```
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	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
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 (0.001 sec)

Retrieve employees in Marketing

The team wants to perform security updates on specific employee machines in the Marketing department.

Our task is to use filters in SQL to create a query that identifies all employees in the Marketing department for all offices in the East building

To do this, we will create two conditions: one that filters employees in marketing, and one that filters employees in the East building.

- We will need to combine the two conditions using AND

```
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)
```

The query results in employee machines that require security updates.

Retrieve employees in Finance or Sales

The team now needs to perform a different security update on machines for employees in the Sales and Finance departments.

We will use filters in SQL to create a query that identifies all employees in the Sales or Finance departments.

The query will be similar to the one for producing the rows of employees in the Marketing department. Here, we will use the OR keyword to include employees in either Sales or Finance.

```
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	j236k303l245	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
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)

Retrieve all employees not in IT

The 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.

We will use filters in SQL to create a query which identifies all employees not in the IT department.

Much like when we were querying for log in attempts outside of Mexico, we will be using the NOT keyword to exclude results of employees in the Information Technology department.

```
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
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
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

In this experiment, we queried databases using SQL to filter rows based on conditions given in a security environment. We filtered results based on values such as date, time, country, and whether or not it was a successful login. We also searched through a database containing hundreds of employee data to pinpoint the specific devices in question during a security incident. We also found what devices need an update through filtering the employee department.