

Apply filters to SQL queries

Project description

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

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

Retrieve after hours failed login attempts

In order to find the attempted logins that failed after business hours to find any potential security incidents I used SQL to query the log_in_attempts table.

```
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	astrada	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	astrada	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)
```

I was able to pull up the table filtering for all failed attempts after 18:00. The means that the login attempt failed. I selected all data from the log_in_attempts table and filtered it to with WHERE and AND to show only the results that had a login_time after 18:00 with “WHERE login_time > '18:00'” and a failed attempt with “AND success = 0;”

Retrieve login attempts on specific dates

There was suspicious activity alert that happened on May 9th 2022 that needed to be investigated. For this I queried the same table to find the odd event.

```
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

I selected all the log_in_attempts that occurred both on the 9th and the day before on the 8th with my query. By using WHERE and OR to select both conditions I could filter the table to only pull them up. The first condition I used was “WHERE login_date = ‘2022-05-08’” which filters for logins the 8th and the second one was “OR login_date = ‘2022-05-09’” which filters for the day the alert was made.

Retrieve login attempts outside of Mexico

After checking the dates, it looked like there was suspicious activity with the logins made from outside of Mexico. I was then tasked with investigating these login attempts, so to do this I used the NOT and LIKE filters for my query.

```
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	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

I selected the attempts from the same log_in_attempts table using “WHERE NOT country LIKE ‘MEX%’;” By doing this I filtered the table to only show attempts from outside of Mexico. Now the database had 2 datasets representing Mexico which were MEXICO, and MEX, so I needed

to use “MEX%” so that the % sign would make sure to filter out any country that includes “MEX” with any number of other characters.

Retrieve employees in Marketing

After this I was prompted with getting information on employee machines so that a team could perform security updates on specific them later. They wanted the information on those in the Marketing department in the East building first so they could start there.

```
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	randeross	Marketing	East-460
1156	a184b775c707	dellery	Marketing	East-417
1163	h679i515j339	cwilliam	Marketing	East-216

7 rows in set (0.003 sec)

To do this I had to query the “employees” table with filters that would only select employees where the department was marketing and east. The command I used was “WHERE” to specify marketing as the department and then “AND” to also filter for the office to be any in the East building with the “LIKE” and “%” filters.

Retrieve employees in Finance or Sales

After updating the Marketing machines, they needed me to now get information on Finance and Sales department machines.

```
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
1022	w237x430y567	arusso	Finance	West-465
1024	y976z753a267	iuduike	Sales	South-215
1025	z381a365b233	jhill	Sales	North-115
1029	d336e475f676	ivelasco	Finance	East-156

To do this I used the same WHERE filter as before but this time I used “OR” too in order to specify that I only wanted results that “=” both the Finance and Sales department.

Retrieve all employees not in IT

After this they needed to do one more update on every machine. The IT department already updated there machines so I only needed to get information on everyone else in the company.

```
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	iclark	Finance	North-188

This time I did a similar command to the last two using “WHERE” on the employees table. This time I had to use the “NOT” filter after “WHERE” in order to specify that I wanted everything except the ones from the “Information Technology” department by doing “WHERE NOT department = ‘Information Technology’;”

Summary

In this project I used filters on SQL queries to acquire needed information for the companies database. I had to query two different tables one was “log_in_attempts” to look for possible suspicious entries and the other was “employees” for their information. The filters I used were AND, NOT, LIKE, OR and % this way I could limit or expand my searches and use the % sign for unknown characters.