

Apply filters to SQL queries

Project description

My organization requests of me to make their systems more secure. To ensure the system is safe I must investigate the system and update computers as needed. I will use SQL to scan and filter the abnormalities.

Retrieve after hours failed login attempts

There was a potential problem that occurred after business hours(after 6:00pm). There seems to be a suspicious amount of failed logins after that time. Below is the following code recreates information of logged in attempts using SQL queries.

```
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 (0.187 sec)

The SQL text is my query request and the graph is the result of my query. My query filters out all login attempts after 6:00pm. To do this I took the data from log_in_attempts table and I used the WHERE line and AND operator to filter out the exact time and date the person tried to log in. By adding clauses for searches for after 18:00 and failed attempts to numeric value 0 I found all the failed attempts.

Retrieve login attempts on specific dates

Upon inspection it is clear that suspicious activity occurred after the date on 05/09/2022. All Login activity should be inspected around that date. The following SQL query filters dates around the suspicious time.

```
MariaDB [organization]> Select *
-> FROM log_in_attempts
-> Where login_date = '2022-05-09' and '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
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
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
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
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
67	abernard	2022-05-09	11:53:41	MEX	192.168.118.29	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
79	abernard	2022-05-09	11:41:15	MEX	192.168.158.170	0
90	gesparza	2022-05-09	00:49:05	CANADA	192.168.87.201	0
96	ivelasco	2022-05-09	22:36:36	CAN	192.168.84.194	0
97	jreckley	2022-05-09	02:49:23	MEXICO	192.168.32.231	1
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
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	luduike	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
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
170	sbaelish	2022-05-09	16:43:18	USA	192.168.65.113	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
190	jsoto	2022-05-09	05:09:21	USA	192.168.25.60	0

40 rows in set, 5 warnings (0.002 sec)

The first part is the query I wrote and the second part the graph is the output.

This query returns all login attempts between 2022-05-09 and 2022-05-08. I selected all data from the log_in_attempt table. then i use the WHERE clause with an OR operator to filter my results to be between the target date. The dates entered filter to be exactly on May 8th and 9th in that order.

Retrieve login attempts outside of Mexico

The initial query made a suspicious detail which points to a location outside of the US. The following query filters login attempts from Mexico.

```
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
19	jhill	2022-05-12	13:09:04	US	192.168.142.245	1
21	iuduke	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
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

The first part is my query and the table is the result of my query. This query returns all login attempts that occurred in countries other than Mexico. First, I started by selecting all data from the log_in_attempts table. Then, I used a WHERE clause with NOT to filter for countries other than Mexico. I used LIKE with MEX% as the pattern to match because the dataset represents Mexico as MEX and MEXICO. The percentage sign (%) represents any number of unspecified characters when used with LIKE.

Retrieve employees in Marketing

My team wanted to update the computers for certain employees in the Marketing department. To do this, I have to get information on which employee machines to update. Below is the SQL Query and the tables as the result.

```
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 first part of the screenshot is my query, and the second part is a portion of the output. This query returns all employees in the Marketing department in the East building. First, I

started by selecting all data from the employees table. Then, I used a WHERE clause with AND to filter for employees who work in the Marketing department and in the East building. I used LIKE with East% as the pattern to match because the data in the office column represents the East building with the specific office number. The first condition is the department = 'Marketing' portion, which filters for employees in the Marketing department. The second condition is the office LIKE 'East%' portion, which filters for employees in the East building.

Retrieve employees in Finance or Sales

The machines for employees in the Finance and Sales departments also need to be updated. I needed to go update security for these groups. I used a SQL query and got the table output below.

```
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

The query to return all data must be taken from the employees table. Then, I used a WHERE clause with OR to filter for employees who are in the Finance and Sales departments. I used the OR operator instead of AND because I want all employees who are in either department. The first condition is department = 'Finance', which filters for employees from the Finance department. The second condition is department = 'Sales', which filters for employees from the Sales department.

Retrieve all employees not in IT

My team wants to update the computers for certain employees in the Marketing department. To do this, I have to get information on which employee machines to update.

```
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	jlsansky	Finance	South-109
1011	l748m120n401	drosas	Sales	South-292

The first part of the screenshot is my query, and the second part is a portion of the output. The query returns all employees not in the Information Technology department. First, I started by selecting all data from the employees table. Then, I used a WHERE clause with NOT to filter for employees not in this department.

Summary

I applied filters to SQL queries to get specific information on login attempts and employee machines. I used two different tables, log_in_attempts and employees. I used the AND, OR, and NOT operators to filter for the specific information needed for each task. I also used LIKE and the percentage sign (%) wildcard to filter for patterns.