

Activity: Complete a join

### Activity overview

As a security analyst, you'll often find that you need data from more than one table.

Previously, you learned that a **relational database** is a structured database containing tables that are related to each other.

**SQL joins** enable you to combine tables that contain a shared column. This is helpful when you need to connect information that appears in different tables.

In this lab activity, you'll use SQL joins to connect separate tables and retrieve needed information.

Get ready to apply what you've learned and **join** some data!

**Note:** The terms **row** and **record** are used interchangeably.

### Scenario

In this scenario, you'll investigate a recent security incident that compromised some machines.

You are responsible for getting the required information from the database for the investigation.

Here's how you'll do this task: **First**, you'll use an inner join to identify which employees are using which machines. **Second**, you'll use left and right joins to find machines that do not belong to any specific user and users who do not have any specific machine assigned to them. **Finally**, you'll use an inner join to list all login attempts made by all employees.

### Task 1. Match employees to their machines

First, you must identify which employees are using which machines. The data is located in the machines and employees tables.

You must use a SQL inner join to return the records you need based on a connecting column. In the scenario, both tables include the device\_id column, which you'll use to perform the join.

1. Run the following query to retrieve all records from the machines table:

```

MariaDB [organization]> SELECT e.employee_id, e.username, e.office, m.device_id, m.operating_system, m.
os_patch_date
->
-> FROM employees e
->
-> INNER JOIN machines m
->
-> ON e.device_id = m.device_id;

```

employee_id	username	office	device_id	operating_system	os_patch_date
1000	el Larson	East-170	a320b137c219	OS 2	2021-03-01
1001	bmoreno	Central-276	b239c825d303	OS 1	2021-03-01
1002	tshah	North-434	c116d593e558	OS 3	2021-09-01
1003	sgilmore	South-153	d394e816f943	OS 3	2021-03-01
1004	eraab	South-127	e218f877g788	OS 2	2021-09-01
1005	gesparza	South-366	f551g340h864	OS 3	2021-12-01
1006	alevitsk	East-320	g329h357i597	OS 1	2021-06-01
1007	wjaffrey	North-406	h174i497j413	OS 2	2021-03-01
1008	abernard	South-170	i858j583k571	OS 2	2021-06-01
1010	jlansky	South-109	k242l212m542	OS 1	2021-03-01
1011	drosas	South-292	l748m120n401	OS 3	2021-09-01
1012	nmason	North-160	m756n668o146	OS 1	2021-09-01
1013	zbernal	South-229	n205o559p243	OS 1	2021-06-01
1015	jsoto	North-271	p611q262r945	OS 1	2021-03-01
1016	sbaelish	North-229	q793r736s288	OS 2	2021-03-01
1017	jclark	North-188	r550s824t230	OS 2	2021-03-01
1018	abellmas	North-403	s310t540u653	OS 1	2021-12-01
1019	mcouliba	North-108	t815u205v470	OS 3	2021-06-01
1020	arutley	South-351	u899v381w363	OS 3	2021-06-01
1021	smartell	South-138	v200w121x977	OS 2	2021-03-01
1022	arusso	West-465	w237x430y567	OS 2	2021-06-01
1023	aalonso	West-393	x253y759z103	OS 1	2021-12-01
1024	iuduike	South-215	y976z753a267	OS 2	2021-06-01
1025	jhill	North-115	z381a365b233	OS 3	2021-12-01
1026	apatel	West-320	a998b568c863	OS 3	2021-12-01
1027	mrhah	West-246	b806c503d354	OS 2	2021-12-01
1028	astrada	West-121	c603d749e374	OS 1	2021-12-01
1029	ivelasco	East-156	d336e475f676	OS 2	2021-06-01
1030	mabadi	West-375	e391f189g913	OS 3	2021-12-01
1031	dkot	West-408	f419g188h578	OS 1	2021-06-01

You'll note that this query is not sufficient to perform the join and retrieve the information you need.

- Complete the query to perform an inner join between the machines and employees tables on the device\_id column. Replace X and Y with this column name:

```

SELECT * FROM machines;
SELECT * FROM employees;
SELECT * FROM machines, employees;
SELECT * FROM machines, employees WHERE machines.device_id = employees.device_id;

```

device_id	quantity	status	email	client	OS	patch	date	employee_id	employee_id	device_id	username	department	office
1000	1	OK	John	Client	Windows	10.0.0.1	2020-01-01	1000	1000	1000	John	Marketing	East-170
1001	1	OK	Jane	Client	Windows	10.0.0.1	2020-01-01	1001	1001	1001	Jane	Marketing	Central-176
1002	1	OK	Bob	Client	Windows	10.0.0.1	2020-01-01	1002	1002	1002	Bob	Human Resources	North-434
1003	1	OK	Alice	Client	Windows	10.0.0.1	2020-01-01	1003	1003	1003	Alice	Finance	South-170
1004	1	OK	Charlie	Client	Windows	10.0.0.1	2020-01-01	1004	1004	1004	Charlie	Human Resources	South-127
1005	1	OK	Diana	Client	Windows	10.0.0.1	2020-01-01	1005	1005	1005	Diana	Human Resources	South-160
1006	1	OK	Eve	Client	Windows	10.0.0.1	2020-01-01	1006	1006	1006	Eve	Human Resources	South-160
1007	1	OK	Frank	Client	Windows	10.0.0.1	2020-01-01	1007	1007	1007	Frank	Human Resources	South-160
1008	1	OK	Grace	Client	Windows	10.0.0.1	2020-01-01	1008	1008	1008	Grace	Human Resources	South-160
1009	1	OK	Heidi	Client	Windows	10.0.0.1	2020-01-01	1009	1009	1009	Heidi	Human Resources	South-160
1010	1	OK	Ivan	Client	Windows	10.0.0.1	2020-01-01	1010	1010	1010	Ivan	Human Resources	South-160
1011	1	OK	Judy	Client	Windows	10.0.0.1	2020-01-01	1011	1011	1011	Judy	Human Resources	South-160
1012	1	OK	Karl	Client	Windows	10.0.0.1	2020-01-01	1012	1012	1012	Karl	Human Resources	South-160
1013	1	OK	Larry	Client	Windows	10.0.0.1	2020-01-01	1013	1013	1013	Larry	Human Resources	South-160
1014	1	OK	Mary	Client	Windows	10.0.0.1	2020-01-01	1014	1014	1014	Mary	Human Resources	South-160
1015	1	OK	Nancy	Client	Windows	10.0.0.1	2020-01-01	1015	1015	1015	Nancy	Human Resources	South-160
1016	1	OK	Oscar	Client	Windows	10.0.0.1	2020-01-01	1016	1016	1016	Oscar	Human Resources	South-160
1017	1	OK	Peter	Client	Windows	10.0.0.1	2020-01-01	1017	1017	1017	Peter	Human Resources	South-160
1018	1	OK	Quinn	Client	Windows	10.0.0.1	2020-01-01	1018	1018	1018	Quinn	Human Resources	South-160
1019	1	OK	Rachel	Client	Windows	10.0.0.1	2020-01-01	1019	1019	1019	Rachel	Human Resources	South-160
1020	1	OK	Steve	Client	Windows	10.0.0.1	2020-01-01	1020	1020	1020	Steve	Human Resources	South-160
1021	1	OK	Tina	Client	Windows	10.0.0.1	2020-01-01	1021	1021	1021	Tina	Human Resources	South-160
1022	1	OK	Uma	Client	Windows	10.0.0.1	2020-01-01	1022	1022	1022	Uma	Human Resources	South-160
1023	1	OK	Victor	Client	Windows	10.0.0.1	2020-01-01	1023	1023	1023	Victor	Human Resources	South-160
1024	1	OK	Wendy	Client	Windows	10.0.0.1	2020-01-01	1024	1024	1024	Wendy	Human Resources	South-160
1025	1	OK	Xavier	Client	Windows	10.0.0.1	2020-01-01	1025	1025	1025	Xavier	Human Resources	South-160
1026	1	OK	Yvonne	Client	Windows	10.0.0.1	2020-01-01	1026	1026	1026	Yvonne	Human Resources	South-160
1027	1	OK	Zoe	Client	Windows	10.0.0.1	2020-01-01	1027	1027	1027	Zoe	Human Resources	South-160
1028	1	OK	Adam	Client	Windows	10.0.0.1	2020-01-01	1028	1028	1028	Adam	Human Resources	South-160
1029	1	OK	Bella	Client	Windows	10.0.0.1	2020-01-01	1029	1029	1029	Bella	Human Resources	South-160
1030	1	OK	Carl	Client	Windows	10.0.0.1	2020-01-01	1030	1030	1030	Carl	Human Resources	South-160
1031	1	OK	Dora	Client	Windows	10.0.0.1	2020-01-01	1031	1031	1031	Dora	Human Resources	South-160
1032	1	OK	Ethan	Client	Windows	10.0.0.1	2020-01-01	1032	1032	1032	Ethan	Human Resources	South-160
1033	1	OK	Fiona	Client	Windows	10.0.0.1	2020-01-01	1033	1033	1033	Fiona	Human Resources	South-160
1034	1	OK	George	Client	Windows	10.0.0.1	2020-01-01	1034	1034	1034	George	Human Resources	South-160
1035	1	OK	Helen	Client	Windows	10.0.0.1	2020-01-01	1035	1035	1035	Helen	Human Resources	South-160
1036	1	OK	Ian	Client	Windows	10.0.0.1	2020-01-01	1036	1036	1036	Ian	Human Resources	South-160
1037	1	OK	Janet	Client	Windows	10.0.0.1	2020-01-01	1037	1037	1037	Janet	Human Resources	South-160
1038	1	OK	Karen	Client	Windows	10.0.0.1	2020-01-01	1038	1038	1038	Karen	Human Resources	South-160
1039	1	OK	Liam	Client	Windows	10.0.0.1	2020-01-01	1039	1039	1039	Liam	Human Resources	South-160
1040	1	OK	Mia	Client	Windows	10.0.0.1	2020-01-01	1040	1040	1040	Mia	Human Resources	South-160
1041	1	OK	Noah	Client	Windows	10.0.0.1	2020-01-01	1041	1041	1041	Noah	Human Resources	South-160
1042	1	OK	Olivia	Client	Windows	10.0.0.1	2020-01-01	1042	1042	1042	Olivia	Human Resources	South-160
1043	1	OK	Peter	Client	Windows	10.0.0.1	2020-01-01	1043	1043	1043	Peter	Human Resources	South-160
1044	1	OK	Quinn	Client	Windows	10.0.0.1	2020-01-01	1044	1044	1044	Quinn	Human Resources	South-160
1045	1	OK	Rachel	Client	Windows	10.0.0.1	2020-01-01	1045	1045	1045	Rachel	Human Resources	South-160
1046	1	OK	Steve	Client	Windows	10.0.0.1	2020-01-01	1046	1046	1046	Steve	Human Resources	South-160
1047	1	OK	Tina	Client	Windows	10.0.0.1	2020-01-01	1047	1047	1047	Tina	Human Resources	South-160
1048	1	OK	Uma	Client	Windows	10.0.0.1	2020-01-01	1048	1048	1048	Uma	Human Resources	South-160
1049	1	OK	Victor	Client	Windows	10.0.0.1	2020-01-01	1049	1049	1049	Victor	Human Resources	South-160
1050	1	OK	Wendy	Client	Windows	10.0.0.1	2020-01-01	1050	1050	1050	Wendy	Human Resources	South-160
1051	1	OK	Xavier	Client	Windows	10.0.0.1	2020-01-01	1051	1051	1051	Xavier	Human Resources	South-160
1052	1	OK	Yvonne	Client	Windows	10.0.0.1	2020-01-01	1052	1052	1052	Yvonne	Human Resources	South-160
1053	1	OK	Zoe	Client	Windows	10.0.0.1	2020-01-01	1053	1053	1053	Zoe	Human Resources	South-160
1054	1	OK	Adam	Client	Windows	10.0.0.1	2020-01-01	1054	1054	1054	Adam	Human Resources	South-160
1055	1	OK	Bella	Client	Windows	10.0.0.1	2020-01-01	1055	1055	1055	Bella	Human Resources	South-160
1056	1	OK	Carl	Client	Windows	10.0.0.1	2020-01-01	1056	1056	1056	Carl	Human Resources	South-160
1057	1	OK	Dora	Client	Windows	10.0.0.1	2020-01-01	1057	1057	1057	Dora	Human Resources	South-160
1058	1	OK	Ethan	Client	Windows	10.0.0.1	2020-01-01	1058	1058	1058	Ethan	Human Resources	South-160
1059	1	OK	Fiona	Client	Windows	10.0.0.1	2020-01-01	1059	1059	1059	Fiona	Human Resources	South-160
1060	1	OK	George	Client	Windows	10.0.0.1	2020-01-01	1060	1060	1060	George	Human Resources	South-160
1061	1	OK	Helen	Client	Windows	10.0.0.1	2020-01-01	1061	1061	1061	Helen	Human Resources	South-160
1062	1	OK	Ian	Client	Windows	10.0.0.1	2020-01-01	1062	1062	1062	Ian	Human Resources	South-160
1063	1	OK	Janet	Client	Windows	10.0.0.1	2020-01-01	1063	1063	1063	Janet	Human Resources	South-160
1064	1	OK	Karen	Client	Windows	10.0.0.1	2020-01-01	1064	1064	1064	Karen	Human Resources	South-160
1065	1	OK	Liam	Client	Windows	10.0.0.1	2020-01-01	1065	1065	1065	Liam	Human Resources	South-160
1066	1	OK	Mia	Client	Windows	10.0.0.1	2020-01-01	1066	1066	1066	Mia	Human Resources	South-160
1067	1	OK	Noah	Client	Windows	10.0.0.1	2020-01-01	1067	1067	1067	Noah	Human Resources	South-160
1068	1	OK	Olivia	Client	Windows	10.0.0.1	2020-01-01	1068	1068	1068	Olivia	Human Resources	South-160
1069	1	OK	Peter	Client	Windows	10.0.0.1	2020-01-01	1069	1069	1069	Peter	Human Resources	South-160
1070	1	OK	Quinn	Client	Windows	10.0.0.1	2020-01-01	1070	1070	1070	Quinn	Human Resources	South-160
1071	1	OK	Rachel	Client	Windows	10.0.0.1	2020-01-01	1071	1071	1071	Rachel	Human Resources	South-160
1072	1	OK	Steve	Client	Windows	10.0.0.1	2020-01-01	1072	1072	1072	Steve	Human Resources	South-160
1073	1	OK	Tina	Client	Windows	10.0.0.1	2020-01-01	1073	1073	1073	Tina	Human Resources	South-160
1074	1	OK	Uma	Client	Windows	10.0.0.1	2020-01-01	1074	1074	1074	Uma	Human Resources	South-160
1075	1	OK	Victor	Client	Windows	10.0.0.1	2020-01-01	1075	1075	1075	Victor	Human Resources	South-160
1076	1	OK	Wendy	Client	Windows	10.0.0.1	2020-01-01	1076	1076	1076	Wendy	Human Resources	South-160
1077	1	OK	Xavier	Client	Windows	10.0.0.1	2020-01-01	1077	1077	1077	Xavier	Human Resources	South-160
1078	1	OK	Yvonne	Client	Windows	10.0.0.1	2020-01-01	1078	1078	1078	Yvonne	Human Resources	South-160
1079	1	OK	Zoe	Client	Windows	10.0.0.1	2020-01-01	1079	1079	1079	Zoe	Human Resources	South-160
1080	1	OK	Adam	Client	Windows	10.0.0.1	2020-01-01	1080	1080	1080	Adam	Human Resources	South-160
1081	1	OK	Bella	Client	Windows	10.0.0.1	2020-01-01	1081	1081	1081	Bella	Human Resources	South-160
1082	1	OK	Carl	Client	Windows	10.0.0.1	2020-01-01	1082	1082	1082	Carl	Human Resources	South-160
1083	1	OK	Dora	Client	Windows	10.0.0.1	2020-01-01	1083	1083	1083	Dora	Human Resources	South-160
1084	1	OK	Ethan	Client	Windows	10.0.0.1	2020-01-01	1084	1084	1084	Ethan	Human Resources	South-160
1085	1	OK	Fiona	Client	Windows	10.0.0.1	2020-01-01	1085	1085	1085	Fiona	Human Resources	South-160
1086	1	OK	George	Client	Windows	10.0.0.1	2020-01-01	1086	1086	1086	George	Human Resources	South-160
1087	1	OK	Helen	Client	Windows	10.0.0.1	2020-01-01	1087	1087	1087	Helen	Human Resources	South-160
1088	1	OK	Ian	Client	Windows	10.0.0.1	2020-01-01	1088	1088	1088	Ian	Human Resources	South-160
1089	1	OK	Janet	Client	Windows	10.0.0.1	2020-01-01	1089	1089	1089	Janet	Human Resources	South-160
1090	1	OK	Karen	Client	Windows	10.0.0.1	2020-01-01	1090	1090	1090	Karen	Human Resources	South-160
1091	1	OK	Liam	Client	Windows	10.0.0.1	2020-01-01	1091	1091	1091	Liam	Human Resources	South-160
1092	1	OK	Mia	Client	Windows	10.0.0.1	2020-01-01	1092	1092	1092	Mia	Human Resources	South-160
1093	1	OK	Noah	Client	Windows	10.0.0.1	2020-01-01	1093	1093	1093	Noah	Human Resources	South-160
1094	1	OK	Olivia	Client	Windows	10.0.0.1	2020-01-01	1094	1094	1094	Olivia	Human Resources	South-160
1095	1	OK	Peter	Client	Windows	10.0.0.1	2020-01-01	1095	1095	1095	Peter	Human Resources	South-160
1096	1	OK	Quinn	Client	Windows	10.0.0.1	2020-01-01	1096	1096	1096	Quinn	Human Resources	South-160
1097	1	OK	Rachel	Client	Windows	10.0.0.1	2020-01-01	1097	1097	1097	Rachel	Human Resources	South-160
1098	1	OK	Steve	Client	Windows	10.0.0.1	2020-01-01	1098	1098	1098	Steve	Human Resources	South-160
1099	1	OK	Tina	Client	Windows	10.0.0.1	2020-01-01	1099	1				

```

MariaDB [organisation]> SELECT *
-->
--> FROM machines
-->
--> LEFT JOIN employees
-->
--> ON machines.device_id = employees.device_id;
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| device_id | operating_system | email_client | OS_patch_date | employee_id | employee_id | device_id | username | department | office |
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| a320b137c219 | OS 2 | Email Client 2 | 2021-03-01 | 1000 | 1000 | a320b137c219 | elarson | Marketing | East-17 |
| b239c825d303 | OS 1 | Email Client 1 | 2021-03-01 | 1001 | 1001 | b239c825d303 | bmoreno | Marketing | Central |
| c116d592e558 | OS 2 | Email Client 1 | 2021-09-01 | 1002 | 1002 | c116d592e558 | tsahah | Human Resources | North-4 |
| d394e816f943 | OS 2 | Email Client 2 | 2021-03-01 | 1003 | 1003 | d394e816f943 | sgilmore | Finance | South-1 |
| e218f877g788 | OS 2 | Email Client 1 | 2021-09-01 | 1004 | 1004 | e218f877g788 | eraab | Human Resources | South-1 |
| f551g340h864 | OS 2 | Email Client 2 | 2021-12-01 | 1005 | 1005 | f551g340h864 | gesparra | Human Resources | South-3 |
| g329h357i597 | OS 1 | Email Client 2 | 2021-06-01 | 1006 | 1006 | g329h357i597 | alevitsk | Information Technology | East-32 |
| h174i497j413 | OS 2 | Email Client 1 | 2021-03-01 | 1007 | 1007 | h174i497j413 | wjaffrey | Finance | North-4 |
| i858j582k571 | OS 2 | Email Client 2 | 2021-06-01 | 1008 | 1008 | i858j582k571 | abernard | Finance | South-1 |
| k242l212m542 | OS 1 | Email Client 1 | 2021-03-01 | 1010 | 1010 | k242l212m542 | jlansky | Finance | South-1 |
| l748m120n401 | OS 2 | Email Client 1 | 2021-09-01 | 1011 | 1011 | l748m120n401 | drosas | Sales | South-2 |
| m756n668o146 | OS 1 | Email Client 2 | 2021-09-01 | 1012 | 1012 | m756n668o146 | nmason | Information Technology | North-1 |
| n205o559p243 | OS 1 | Email Client 2 | 2021-06-01 | 1013 | 1013 | n205o559p243 | abernal | Information Technology | South-2 |
| p611q262r945 | OS 1 | Email Client 2 | 2021-03-01 | 1015 | 1015 | p611q262r945 | jsoto | Finance | North-2 |
| q792r736s288 | OS 2 | Email Client 1 | 2021-03-01 | 1016 | 1016 | q792r736s288 | sbaelish | Human Resources | North-2 |
| r550s824t230 | OS 2 | Email Client 1 | 2021-03-01 | 1017 | 1017 | r550s824t230 | jclark | Finance | North-1 |
| s310t540u653 | OS 1 | Email Client 2 | 2021-12-01 | 1018 | 1018 | s310t540u653 | abellmas | Finance | North-4 |
| t815u205v470 | OS 2 | Email Client 1 | 2021-06-01 | 1019 | 1019 | t815u205v470 | mcouliba | Information Technology | North-1 |
| u899v381w363 | OS 2 | Email Client 1 | 2021-06-01 | 1020 | 1020 | u899v381w363 | arutley | Marketing | South-3 |
| v200w121x977 | OS 2 | Email Client 2 | 2021-03-01 | 1021 | 1021 | v200w121x977 | smartell | Information Technology | South-1 |
| w237x430y567 | OS 2 | Email Client 2 | 2021-06-01 | 1022 | 1022 | w237x430y567 | arusso | Finance | West-46 |
| x252y759z103 | OS 1 | Email Client 2 | 2021-12-01 | 1023 | 1023 | x252y759z103 | aalonso | Information Technology | West-39 |
| y976z753a267 | OS 2 | Email Client 2 | 2021-06-01 | 1024 | 1024 | y976z753a267 | iuduike | Sales | South-2 |
| z381a265b233 | OS 2 | Email Client 2 | 2021-12-01 | 1025 | 1025 | z381a265b233 | jhill | Sales | North-1 |

```

- Run the following SQL query to connect the machines and employees tables through a right join. You must replace the keyword X in the query to solve the problem:

```

MariaDB [organisation]> SELECT *
-->
--> FROM machines
-->
--> RIGHT JOIN employees
-->
--> ON machines.device_id = employees.device_id;

```

device_id	operating_system	email_client	OS_patch_date	employee_id	employee_id	device_id	username	department	office
a320b137c219	OS 2	Email Client 2	2021-03-01	1000	1000	a320b137c219	clarson	Marketing	East-17
b239c825d303	OS 1	Email Client 1	2021-03-01	1001	1001	b239c825d303	kmoreno	Marketing	Central
c116d593e558	OS 3	Email Client 1	2021-09-01	1002	1002	c116d593e558	tshah	Human Resources	North-4
d394e816f943	OS 3	Email Client 2	2021-03-01	1003	1003	d394e816f943	sgilmore	Finance	South-1
e218f877g788	OS 2	Email Client 1	2021-09-01	1004	1004	e218f877g788	eraab	Human Resources	South-1
f551g340h864	OS 3	Email Client 2	2021-12-01	1005	1005	f551g340h864	gesparza	Human Resources	South-3
g329h357i597	OS 1	Email Client 2	2021-06-01	1006	1006	g329h357i597	alevitsk	Information Technology	East-32
h174i497j413	OS 2	Email Client 1	2021-03-01	1007	1007	h174i497j413	wjaffrey	Finance	North-4
i858j583k571	OS 2	Email Client 2	2021-06-01	1008	1008	i858j583k571	abernard	Finance	South-1
NULL	NULL	NULL	NULL	1009	1009	NULL	lrodriagu	Sales	South-1
k242l212m542	OS 1	Email Client 1	2021-03-01	1010	1010	k242l212m542	jlansky	Finance	South-1
l748m120n401	OS 3	Email Client 1	2021-09-01	1011	1011	l748m120n401	dcrosas	Sales	South-2
m756n668o146	OS 1	Email Client 2	2021-09-01	1012	1012	m756n668o146	nmason	Information Technology	North-1
n205o559p243	OS 1	Email Client 2	2021-06-01	1013	1013	n205o559p243	sbernal	Information Technology	South-2
NULL	NULL	NULL	NULL	1014	1014	NULL	asundara	Information Technology	West-21
p611q262r945	OS 1	Email Client 2	2021-03-01	1015	1015	p611q262r945	jsoto	Finance	North-2
q792r736s288	OS 2	Email Client 1	2021-03-01	1016	1016	q792r736s288	shaelish	Human Resources	North-2
r550s824t230	OS 2	Email Client 1	2021-03-01	1017	1017	r550s824t230	jclark	Finance	North-1
s310t540u653	OS 1	Email Client 2	2021-12-01	1018	1018	s310t540u653	abellmas	Finance	North-4
t815u205v470	OS 3	Email Client 1	2021-06-01	1019	1019	t815u205v470	mcouliba	Information Technology	North-1
u899v381w363	OS 3	Email Client 1	2021-06-01	1020	1020	u899v381w363	arutley	Marketing	South-3
v200w121x977	OS 2	Email Client 2	2021-03-01	1021	1021	v200w121x977	smartell	Information Technology	South-1
w237x430y567	OS 2	Email Client 2	2021-06-01	1022	1022	w237x430y567	arusso	Finance	West-46
x253y759z103	OS 1	Email Client 2	2021-12-01	1023	1023	x253y759z103	aalonso	Information Technology	West-39
y976z753a267	OS 2	Email Client 2	2021-06-01	1024	1024	y976z753a267	induite	Sales	South-2
z381a365b233	OS 3	Email Client 2	2021-12-01	1025	1025	z381a365b233	jhill	Sales	North-1
a998b568c863	OS 3	Email Client 1	2021-12-01	1026	1026	a998b568c863	spatel	Human Resources	West-32
b806c503d354	OS 2	Email Client 1	2021-12-01	1027	1027	b806c503d354	mrah	Marketing	West-24

### Task 3. Retrieve login attempt data

To continue investigating the security incident, you must retrieve the information on all employees who have made login attempts. To achieve this, you'll perform an inner join on the employees and log\_in\_attempts tables, linking them on the common username column.

- Run the following SQL query to perform an inner join on the employees and log\_in\_attempts tables. Replace X with the name of the right table. Then replace Y and Z with the name of the column that connects the two tables:

```

MariaDB [organization]> SELECT
-> -> FROM employees
-> INNER JOIN log_in_attempts
-> ON employees.username = log_in_attempts.username;

```

employee_id	device_id	username	department	office	event_id	username	login_data	login_time	country	ip_address	success
1032	g77b3031639	jzafael	Information Technology	Central-309	1	jzafael	2022-05-08 04:56:27	CAN	192.168.243.148	0	
1026	s58b8568083	apatal	Human Resources	West-320	2	apatal	2022-05-10 20:27:27	CAN	192.168.205.12	0	
1031	f415g188078	dnet	Marketing	West-408	3	dnet	2022-05-08 08:47:41	USA	192.168.131.162	0	
1031	f415g188078	dnet	Marketing	West-408	4	dnet	2022-05-08 09:00:35	USA	192.168.138.71	0	
1032	g77b3031639	jzafael	Information Technology	Central-309	5	jzafael	2022-05-11 03:05:55	CANADA	192.168.86.132	0	
1000	s58b8568083	apatal	Marketing	South-311	6	apatal	2022-05-12 17:00:45	MEXICO	192.168.13.24	0	
1004	e215f577988	asash	Human Resources	South-127	7	asash	2022-05-11 01:45:14	CAN	192.168.170.243	0	
1032	g77b3031639	jzafael	Marketing	South-170	8	hizale	2022-05-08 03:20:17	CS	192.168.112.572	0	
1033	h11b1	yagupiah	Information Technology	West-387	9	yagupiah	2022-05-11 13:47:55	MEX	192.168.55.136	0	
1032	g77b3031639	jzafael	Information Technology	Central-309	10	jzafael	2022-05-12 09:32:15	CANADA	192.168.226.221	0	
1007	d186d161543	ajlimesa	Finance	South-113	11	ajlimesa	2022-05-11 15:16:53	CANADA	192.168.142.61	0	
1031	f415g188078	dnet	Marketing	West-408	12	dnet	2022-05-08 09:11:34	USA	192.168.100.158	0	
1027	s58b8568083	asash	Marketing	West-246	13	asash	2022-05-11 09:28:34	USA	192.168.246.138	0	
1016	q73b7362888	shashilab	Human Resources	South-229	14	shashilab	2022-05-10 10:20:18	US	192.168.16.85	0	
1016	q73b7362888	shashilab	Human Resources	South-229	15	shashilab	2022-05-10 10:20:18	US	192.168.16.85	0	
1013	t815b205c470	monvillha	Information Technology	South-108	16	monvillha	2022-05-11 04:44:22	CAN	192.168.172.189	0	
1048	t367d444c434	psamling	Finance	East-115	17	psamling	2022-05-11 09:33:02	US	192.168.41.88	0	
1025	s381a365233	hull	Sales	North-113	19	hull	2022-05-12 13:09:04	CS	192.168.142.248	0	
1002	c116d593558	tahab	Human Resources	South-434	20	tahab	2022-05-12 18:16:36	MEXICO	192.168.105.50	0	
1024	y7f67326267	iduchile	Sales	South-213	21	iduchile	2022-05-11 17:50:00	US	192.168.131.147	0	
1016	t367d444c434	psamling	Marketing	Central-229	22	yjames	2022-05-11 00:59:55	MEX	192.168.212.228	0	
1033	h11b1	yagupiah	Information Technology	West-387	23	yagupiah	2022-05-10 18:11:53	MEXICO	192.168.200.48	0	
1022	w07d430c267	asasac	Finance	West-455	24	asasac	2022-05-08 08:49:35	MEXICO	192.168.171.152	0	
1016	q73b7362888	shashilab	Human Resources	South-229	25	shashilab	2022-05-08 07:04:02	US	192.168.13.117	0	
1026	s58b8568083	apatal	Human Resources	West-320	26	apatal	2022-05-08 17:27:00	CANADA	192.168.123.105	0	
1026	s58b8568083	apatal	Information Technology	West-320	27	apatal	2022-05-08 09:45:34	USA	192.168.102.200	0	
1028	ce15f745674	asastads	Human Resources	West-121	28	asastads	2022-05-08 19:28:12	MEXICO	192.168.27.47	0	
1032	g77b3031639	jzafael	Marketing	South-170	29	hizale	2022-05-08 03:20:17	CS	192.168.112.572	0	
1033	h11b1	yagupiah	Information Technology	West-387	30	yagupiah	2022-05-08 03:22:22	MEX	192.168.154.48	0	
1042	q17b138a833	asoonb	Human Resources	West-381	31	asoonb	2022-05-12 17:36:45	CANADA	192.168.58.132	0	
1042	q17b138a833	asoonb	Human Resources	West-381	32	asoonb	2022-05-12 02:37:02	CANADA	192.168.142.238	0	
1031	s58b8568083	apatal	Information Technology	South-229	33	shasamal	2022-05-11 02:55:10	US	192.168.72.85	0	
1011	t148d121540	asousa	Sales	South-252	34	asousa	2022-05-12 02:02:04	CS	192.168.45.53	0	
1002	c116d593558	tahab	Human Resources	South-434	35	tahab	2022-05-10 19:24:08	MEX	192.168.92.147	0	
1004	e215f577988	asash	Marketing	South-127	36	asash	2022-05-08 03:20:17	CS	192.168.112.572	0	
1004	e215f577988	asash	Human Resources	South-127	37	asash	2022-05-10 06:03:41	CANADA	192.168.152.148	0	
1016	q73b7362888	shashilab	Human Resources	South-229	38	shashilab	2022-05-08 14:40:21	US	192.168.40.42	0	
1033	h11b1	yagupiah	Information Technology	West-387	39	yagupiah	2022-05-08 07:04:02	MEXICO	192.168.17.115	0	
1021	s231755a103	alimosa	Information Technology	West-383	40	alimosa	2022-05-12 15:15:46	MEX	192.168.174.186	0	
1026	s58b8568083	apatal	Human Resources	West-320	41	apatal	2022-05-10 17:39:42	CANADA	192.168.46.207	0	
1041	p525g222c778	opiffaff	Sales	North-208	42	opiffaff	2022-05-13 20:04:05	US	192.168.4.187	0	
1048	w465921a138	daquino	Information Technology	West-280	43	daquino	2022-05-08 02:18:34	CANADA	192.168.162.208	0	
1046	w465921a138	daquino	Finance	West-280	44	daquino	2022-05-08 07:02:35	CANADA	192.168.168.144	0	
1037	l618b565c28	dtanaka	Information Technology	West-468	45	dtanaka	2022-05-11 10:28:34	US	192.168.223.137	0	
1004	e215f577988	asash	Marketing	South-127	46	asash	2022-05-11 11:25:27	CAN	192.168.24.15	0	
1031	f415g188078	dnet	Marketing	West-408	47	dnet	2022-05-08 09:06:45	US	192.168.233.24	0	
1014	h11b1	asandead	Information Technology	West-215	48	asandead	2022-05-11 03:16:45	USA	192.168.79.16	0	
1021	s231755a103	alimosa	Information Technology	West-383	49	asandead	2022-05-08 14:00:01	CS	192.168.173.213	0	
1032	g77b3031639	jzafael	Information Technology	Central-309	50	jzafael	2022-05-10 22:40:01	CANADA	192.168.148.113	0	
1039	s58b8568083	apatal	Marketing	South-229	51	jzafael	2022-05-10 22:40:01	CANADA	192.168.148.113	0	
1039	s58b8568083	apatal	Marketing	South-229	52	cjckam	2022-05-10 22:07:07	CAN	192.168.58.37	0	
1012	s746d60c446	masan	Information Technology	South-165	53	masan	2022-05-08 11:51:38	CAN	192.168.133.188	0	
1048	h11b1	asandead	Finance	Central-298	54	asandead	2022-05-10 15:11:15	MEXICO	192.168.187.152	0	
1012	s746d60c446	masan	Marketing	South-165	55	masan	2022-05-12 15:15:34	CAN	192.168.4.136	0	
1042	q17b138a833	asoonb	Human Resources	West-381	56	asoonb	2022-05-08 04:56:30	CAN	192.168.209.130	0	
1014	h11b1	asandead	Information Technology	West-215	57	asandead	2022-05-12 03:16:45	CS	192.168.173.213	0	
1039	d186d161543	ajlimesa	Finance	East-115	58	asandead	2022-05-10 22:40:01	CAN	192.168.57.162	0	
1036	x3501531205	yjames	Marketing	Central-229	59	yjames	2022-05-12 04:52:08	MEX	192.168.54.140	0	
1042	q17b138a833	asoonb	Human Resources	West-381	60	asoonb	2022-05-11 21:44:00	CAN	192.168.14.45	0	
1037	l618b565c28	dtanaka	Information Technology	West-468	61	dtanaka	2022-05-09 09:45:18	USA	192.168.58.221	0	
1008	s58b8568083	apatal	Marketing	South-170	62	shashilab	2022-05-10 10:20:17	MEXICO	192.168.164.224	0	
1048	w465921a138	daquino	Finance	South-288	63	tritohel	2022-05-11 14:13:41	MEXICO	192.168.110.131	0	
1008	s58b8568083	apatal	Human Resources	West-320	64	apatal	2022-05-12 22:38:21	CANADA	192.168.172.71	0	
1023	s231755a103	alimosa	Information Technology	West-383	65	alimosa	2022-05-08 23:42:12	MEX	192.168.52.37	0	
1028	ce15f745674	asastads	Human Resources	West-121	66	asastads	2022-05-08 21:58:22	MEX	192.168.47.223	0	
1008	s58b8568083	apatal	Finance	South-170	67	asandead	2022-05-12 11:57:41	MEX	192.168.118.25	0	
1027	b505c530c234	asash	Marketing	West-246	68	asash	2022-05-08 17:16:13	US	192.168.42.248	0	
1037	h174d747413	yjaffay	Finance	South-404	69	yjaffay	2022-05-11 09:45:15	USA	192.168.101.17	0	
1048	w465921a138	daquino	Finance	South-288	70	tritohel	2022-05-08 10:55:17	MEXICO	192.168.87.159	0	
1004	e215f577988	asash	Information Technology	West-387	71	shashilab	2022-05-12 10:20:17	CANADA	192.168.133.178	0	
1013	s58b8568083	apatal	Information Technology	South-229	72	alewtak	2022-05-08 12:09:10	CANADA	192.168.139.178	0	
1012	s746d60c446	masan	Marketing	South-165	73	shasamal	2022-05-10 17:44:45	USA	192.168.80.46	0	
1031	s58b8568083	apatal	Information Technology	South-229	74	masan	2022-05-11 13:15:48	CAN	192.168.162.5	0	
1031	s58b8568083	apatal	Information Technology	South-229	75	shasamal	2022-05-12 04:14:35	US	192.168.188.63	0	
1001	h236b856333	camasa	Marketing	South-170	76	camasa	2022-05-08 09:23:45	CS	192.168.43.80	0	
1037	h174d747413	yjaffay	Finance	South-404	77	yjaffay	2022-05-12 08:37:55	US	192.168.108.183	0	
1021	s231755a103	alimosa	Information Technology	West-383	78	shasamal	2022-05-12 08:37:55	CS	192.168.43.80	0	
1039	s58b8568083	apatal	Finance	South-170	79	asandead	2022-05-08 11:41:15	MEX	192.168.158.170	0	
1023	s231755a103	alimosa	Information Technology	West-383	80	cjckam	2022-05-08 02:16:10	CANADA	192.168.133.140	0	
1023	s231755a103	alimosa	Information Technology	West-383	81	alimosa	2022-05-11 12:50:38	MEX	192.168.152.43	0	
1008	s58b8568083	apatal	Finance	South-170	82	asandead	2022-05-12 23:38:46	MEX	192.168.234.45	0	
1008	h11b1	asandead	Marketing	South-165	83	l618b565c28	2022-05-08 09:45:18	USA	192.168.58.221	0	
1032	g77b3031639	jzafael	Information Technology	Central-309	84	jzafael	2022-05-11 09:26:17	CAN	192.168.243.203	0	
1046	q17b138a833	asoonb	Human Resources	West-381	85	dnet	2022-05-10 09:06:45	US	192.168.233.24	0	
1037	l618b565c28	dtanaka	Information Technology	West-468	86	dtanaka	2022-05-10 10:22:20	USA	192.168.197.135	0	
1026	s58b8568083	apatal	Human Resources	West-320	87	apatal	2022-05-08 22:38:21	CANADA	192.168.132.153	0	
1028	ce15f745674	asastads	Human Resources	West-121	88	asastads	2022-05-12 11:21:50	MEXICO	192.168.132.77	0	
1031	f415g188078	dnet	Marketing	West-408	89	dnet	2022-05-12 10:52:00	USA	192.168.128.75	0	
1008	s58b8568083	apatal	Human Resources	West-320	90	asandead	2022-05-08 09:45:18	CANADA	192.168.87.201	0	
1025	s381a365233	hull	Sales	North-113	91	hull	2022-05-11 17:44:47	US	192.168.172.74	0	
1048	w465921a138	daquino	Marketing	East-115	92	psamling	2022-05-08 09:33:02	US	192.168.247.219	0	
1049	h11b1	yagupiah	Finance	Central-298	93	yagupiah	2022-05-12 04:31:30	MEX	192.168.108.24	0	

## Lab Summary: Complete a Join

### Objective

This lab focused on using SQL joins to combine data from multiple tables for investigation.

### Tasks Completed

- Used an **INNER JOIN** on employees and machines with device\_id to identify which employees use which machines.
- Applied a **LEFT JOIN** to return all machines, including those not assigned to employees.
- Applied a **RIGHT JOIN** to return all employees, including those without assigned machines.
- Performed an **INNER JOIN** between employees and log\_in\_attempts on username to retrieve login attempt data.

**Summary**

This lab demonstrated how INNER, LEFT, and RIGHT joins connect related tables, which is essential for analyzing employee, machine, and login activity data during security investigations.