My project using Joins to combine data from multiple tables in a database

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

Scenario

In this scenario, I need to investigate a recent security incident that compromised some machines.

I am responsible for getting the required information from the database for the investigation.

First, I'll use an inner join to identify which employees are using which machines. **Second**, I'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**, I'll use an inner join to list all login attempts made by all employees.

Task 1. Match employees to their machines

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

I will use a SQL inner join to return the records needed based on a connecting column. In the scenario, both tables include the device_id column, which I'll use to perform the join.

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

SELECT *

FROM machines;

2. To complete the query to perform an inner join between the machines and employees tables on the device_id column. I need to replace X and Y with this column name:

SELECT *

FROM machines

INNER JOIN employees ON machines.X = employees.Y;

To complete a join, I need to link the joined tables on a common column. In the case of the employees and machines tables, the device_id column is common.

The query to solve this step:

SELECT *

FROM machines

INNER JOIN employees ON machines.device_id = employees.device_id;

Question: How many rows did the inner join return?

Answer: The inner join query returned 185 rows.

I completed this task and identified which employees are using which machines using INNER JOIN.

Task 2. Return more data

I'll now return the information on all machines and the employees who have machines. Next, I'll do the reverse and retrieve the information of all employees and any machines that are assigned to them.

To achieve this, I'll complete a left join and a right join on the employees and machines tables. The results will include all records from one or the other table. I'll link these tables using the common device_id column.

1. To run the following SQL query to connect the machines and employees tables through a left join. I'll replace the keyword X in the query:

SELECT *

FROM machines

X JOIN employees ON machines.device_id = employees.device_id;

The query to solve this step:

SELECT *

FROM machines

LEFT JOIN employees ON machines.device_id = employees.device_id;.

Question: What is the value in the username column for the last record returned?

Answer: The last username returned is NULL.

2. Run the following SQL query to connect the machines and employees tables through a right join. I'll replace the keyword X in the query to solve the problem:

SELECT *

FROM machines

X JOIN employees ON machines.device_id = employees.device_id;

The query to solve this step:

SELECT *

FROM machines

RIGHT JOIN employees ON machines.device_id = employees.device_id;

Question: What is the value in the username column for the last record returned?

Answer: The value in the username column for the last record returned is areyes.

I completed this task and performed a left join and right join on the employees and machines tables.

Task 3. Retrieve login attempt data

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

- To run the following SQL query to perform an inner join on the employees and log_in_attempts tables. I will 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:

SELECT *

FROM employees

INNER JOIN X ON Y = Z;

The query to solve this step:

SELECT *

FROM employees

INNER JOIN log_in_attempts ON employees.username = log_in_attempts.username;

Question: How many records are returned by this inner join?

Answer: There are 200 records returned by the inner join.

I completed this task and executed a query that returns the information on all employees who have made login attempts. And I am able to use joins to combine data from multiple tables in a database.

I now have practical experience in using

- INNER JOIN,
- LEFT JOIN, and
- RIGHT JOIN.