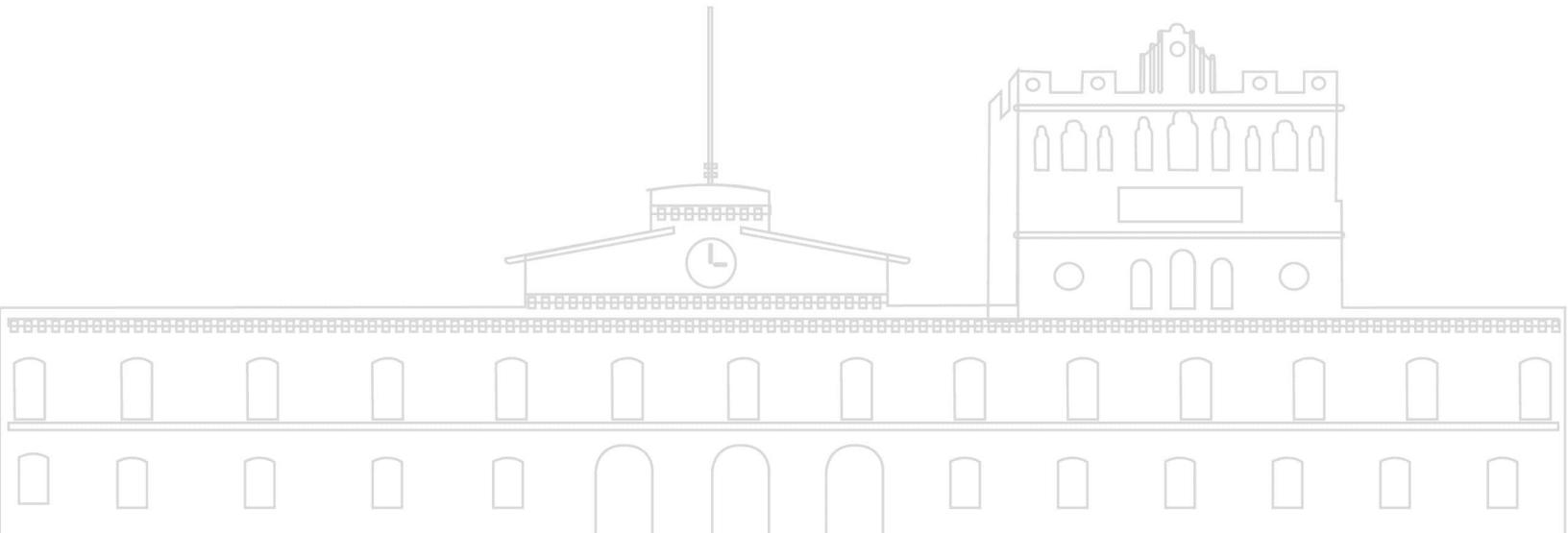


REPORTE DE PRÁCTICA NO. 3

NOMBRE DE LA PRÁCTICA: Álgebra relacional y SQL
(1)

ALUMNO:

José Eduardo Valles Aguilera



1. Introducción

Diseñar y hacer consultas en una base de datos a través de sentencias derivadas del álgebra relacional

2. Marco teórico

Álgebra relacional

En la teoría de bases de datos, el álgebra relacional es una teoría que utiliza estructuras algebraicas con una semántica bien fundamentada para modelar datos y definir consultas sobre ellos. La teoría fue presentada por Edgar F. Codd. El propósito principal del álgebra relacional es definir operadores que transformen una o más relaciones de entrada en una relación de salida. Dado que estos operadores aceptan relaciones como entrada y producen relaciones como salida, pueden combinarse y usarse para expresar consultas potencialmente complejas que transforman potencialmente muchas relaciones de entrada (cuyos datos se almacenan en la base de datos) en una sola relación de salida (los resultados de la consulta).

colaboradores de Wikipedia. (2024, 7 octubre). Álgebra relacional. Wikipedia, la Enciclopedia Libre. <https://es.wikipedia.org/wiki/>

SQL

SQL (por sus siglas en inglés Structured Query Language; en español lenguaje de consulta estructurada) es un lenguaje específico de dominio, diseñado para administrar, y recuperar información de sistemas de gestión de bases de datos relacionales. Una de sus principales características es el manejo del álgebra y el cálculo relacional para efectuar consultas con el fin de recuperar, de forma sencilla, información de bases de datos, así como realizar cambios en ellas.

colaboradores de Wikipedia. (2024b, noviembre 11). SQL. Wikipedia, la Enciclopedia Libre. <https://es.wikipedia.org/wiki/SQL>

MySQL

MySQL es un sistema de gestión de bases de datos relacional desarrollado bajo licencia dual: licencia pública general/licencia comercial por Oracle Corporation y está considerada como la base de datos de código abierto más popular del mundo, y una de las más populares en general junto a Oracle y Microsoft SQL Server, todo para entornos de desarrollo web.

Para esta práctica, se han utilizado las siguientes sentencias para crear y consultar una base de datos que almacena información sobre los empleados de una empresa y los bonos que obtienen en determinada fecha

```
CREATE DATABASE Algebrarelacional;
USE Algebrarelacional;
CREATE TABLE Employee (
EmployeeID INT PRIMARY KEY,
First_name VARCHAR(50),
Last_name VARCHAR(50),
Salary DECIMAL(10, 2),
Joining_date DATE,
Department VARCHAR(50)
);
```

```
CREATE TABLE Reward(
Employee_ref INT PRIMARY KEY,
Reward_date DATE,
Reward_amount DECIMAL(10, 2)
);
```

```
INSERT INTO Employee VALUES(1, 'Bob', 'Kinto', 1000000.00, '2019-01-20', 'Finance');
INSERT INTO Employee VALUES(2, 'Jerry', 'Kansxo', 6000000.00, '2019-01-15', 'IT');
INSERT INTO Employee VALUES(3, 'Philip', 'Jose', 8900000.00, '2019-02-05', 'Banking');
INSERT INTO Employee VALUES(4, 'John', 'Abraham', 2000000.00, '2019-02-25', 'Insurance');
```

```


INSERT INTO EmployeeVALUES(5,'Michael','Mathew',2200000.00,'2019-02-28','Finance');
INSERT INTO EmployeeVALUES(6,'Alex','Chreketo',4000000.00,'2019-05-10','IT');
INSERT INTO EmployeeVALUES(7,'Yohan','Soso',1230000.00,'2019-06-10','Banking');

INSERT INTO RewardVALUES(1,'2019-05-11',1000.00);
INSERT INTO RewardVALUES(2,'2019-02-15',5000.00);
INSERT INTO RewardVALUES(3,'2019-04-22',2000.00);
INSERT INTO RewardVALUES(4,'2019-06-20',8000.00);

--5.Obtener todos los empleados
SELECT * FROM Employee;

--6.Obtener el primer nombre y apellido de todos los empleados
SELECT First_name, Last_name FROM Employee;

--7.Obtener la columna First_name con alias
SELECT First_name AS "Nombre del empleado" FROM Employee;

--8.Obtener Last_name en minúsculas
SELECT LOWER(Last_name) FROM Employee;

--9.Obtener Last_name en mayúsculas
SELECT UPPER(Last_name) FROM Employee;

--10.Obtener nombres únicos de la columna Department
SELECT DISTINCT Department FROM Employee;

--11.Obtener los primeros 4 caracteres de First_name
SELECT SUBSTRING(First_name, 1, 4) FROM Employee;

--12.Posición de "h" en First_name = "Jhon"
SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon';

--13.Eliminar espacios en blanco de la derecha de First_name
SELECT RTRIM(First_name) FROM Employee;

--14.Eliminar espacios en blanco de la izquierda de First_name
SELECT LTRIM(First_name) FROM Employee;


```

4. Desarrollo

Análisis de requisitos

EJERCICIOS.

1. Escribe la sintaxis para crear la tabla “Employee”.
2. Escribe la sintaxis para insertar 7 registros (de la imagen) a la tabla “Employee”.
3. Escribe la sintaxis para crear la tabla “Reward”.
4. Escribe la sintaxis para insertar 4 registros (en la imagen) a la tabla “Reward”.
5. Obtener todos los empleados.
6. Obtener el primer nombre y apellido de todos los empleados.
7. Obtener todos los valores de la columna `\First_name` usando el alias “Nombre de empleado”.
8. Obtener todos los valores de la columna `'Last_name'` in minsculas.
9. Obtener todos los valores de la columna `\Last_name` en mayúsculas.
10. Obtener los nombre únicos de la columna `\Departament`.
11. Obtener los primeros 4 caracteres de todos los valors de la columna `\First_name`.
12. Obtener la posición de la letra “h” en el nombre del empleado con `First_name = 'Jhon'`.
13. Obtener todos los valores de la columna `\First_name` después de remover los espacios en blanco de la derecha.
14. Obtener todos los valores de la columna `\First_name` después de remover los espacios en blanco de la izquierda.

The screenshot shows the MySQL Workbench interface with the following details:

- Query Editor:** Contains the following SQL code:

```
1 • CREATE DATABASE Algebralacional;
2 • USE Algebralacional;
3 • CREATE TABLE Employee (
4     Employee_ID INT PRIMARY KEY,
5     First_name VARCHAR(50),
6     Last_name VARCHAR(50),
7     Salary DECIMAL(10,2),
8     Joining_date DATE,
9     Department VARCHAR(50)
10 );
11
12 • CREATE TABLE Reward (
13     Employee_reef_ID INT PRIMARY KEY,
```
- Result Grid:** Displays the data inserted into the Employee table:

Employee_ID	First_name	Last_name	Salary	Joining_date	Department
1	Bob	Kinto	1000000.00	2019-01-20	Finance
2	Jerry	Kanxio	6000000.00	2019-01-15	IT
3	Philip	Jose	8900000.00	2019-02-05	Banking
4	John	Abraham	2000000.00	2019-02-25	Insurance
5	Michael	Mathew	2200000.00	2019-02-28	Finance
- Action Output:** Shows the history of actions taken in the session, including queries like `SELECT UPPER>Last_name`, `SELECT DISTINCT Department`, and `SELECT LOCATE('First_name', 'Jhon')`.
- Session Status:** Shows the current session status with various connection and system icons.

The screenshot shows the MySQL Workbench interface with the following details:

- Navigator:** Shows the database structure with the Reward table under the Employee table.
- Query Editor (Query 1):**

```

12 • CREATE TABLE Reward (
13     Employee_reward_ID INT PRIMARY KEY,
14     Reward_Date DATE,
15     Reward_Amount DECIMAL(10,2)
16 );
17
18 • INSERT INTO Employee VALUES (1, 'Bob', 'Klnto', 1000000.00, '2019-01-08', 'Finance');
19 • INSERT INTO Employee VALUES (2, 'Jerry', 'Kansxo', 6000000.00, '2019-01-15', 'IT');
20 • INSERT INTO Employee VALUES (3, 'Philip', 'Jose', 8900000.00, '2019-02-05', 'Banking');
21 • INSERT INTO Employee VALUES (4, 'John', 'Abrahm', 2000000.00, '2019-02-25', 'Insurance');
22 • INSERT INTO Employee VALUES (5, 'Michael', 'Mathew', 2200000.00, '2019-02-28', 'Finance');
23 • INSERT INTO Employee VALUES (6, 'Alex', 'Chrekofo', 4000000.00, '2019-05-10', 'IT');
24 • INSERT INTO Employee VALUES (7, 'Yohan', 'Soso', 12300000.00, '2019-06-10', 'Banking'));

```
- Result Grid:** Displays the data inserted into the Employee table.
- Action Output:** Shows the history of actions taken on the database.
- System Bar:** Includes the Windows taskbar with various application icons and system status.

Figure 1: Creación de la base de datos y las tablas

The screenshot shows the MySQL Workbench interface with the following details:

- Navigator:** Shows the database structure with the Reward table under the Employee table.
- Query Editor (Query 1):**

```

17
18 • INSERT INTO Employee VALUES (1, 'Bob', 'Klnto', 1000000.00, '2019-01-08', 'Finance');
19 • INSERT INTO Employee VALUES (2, 'Jerry', 'Kansxo', 6000000.00, '2019-01-15', 'IT');
20 • INSERT INTO Employee VALUES (3, 'Philip', 'Jose', 8900000.00, '2019-02-05', 'Banking');
21 • INSERT INTO Employee VALUES (4, 'John', 'Abrahm', 2000000.00, '2019-02-25', 'Insurance');
22 • INSERT INTO Employee VALUES (5, 'Michael', 'Mathew', 2200000.00, '2019-02-28', 'Finance');
23 • INSERT INTO Employee VALUES (6, 'Alex', 'Chrekofo', 4000000.00, '2019-05-10', 'IT');
24 • INSERT INTO Employee VALUES (7, 'Yohan', 'Soso', 12300000.00, '2019-06-10', 'Banking');
25
26 • INSERT INTO Reward VALUES (1, '2019-05-11', 1000.00);
27 • INSERT INTO Reward VALUES (2, '2019-02-15', 5000.00);
28 • INSERT INTO Reward VALUES (3, '2019-04-22', 2000.00);
29 • INSERT INTO Reward VALUES (4, '2019-06-20', 8000.00);

```
- Result Grid:** Displays the data inserted into the Reward table.
- Action Output:** Shows the history of actions taken on the database.
- System Bar:** Includes the Windows taskbar with various application icons and system status.

Figure 2: Inserción de registros

MySQL Workbench

Local instance MySQL80 X

File Edit View Query Database Server Tools Scripting Help

Navigator: Local instance MySQL80

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

Administration Schemas

Information Employee 1 Employee 2 Employee 3 Result 4 Result 5 Employee 6 Result 7 Result 8 Result 9 Result 10 Apply Revert Context Help Snippets

No object selected

Output:

Action Output

#	Time	Action	Message	Duration / Fetch
20	21:36:14	SELECT UPPER>Last_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
21	21:36:14	SELECT DISTINCT Department FROM Employee LIMIT 0, 1000	4row(s) returned	0.015 sec / 0.000 sec
22	21:36:14	SELECT SUBSTRING(First_name, 1, 4) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
23	21:36:14	SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon' LIMIT 0, 1000	0row(s) returned	0.000 sec / 0.000 sec
24	21:36:14	SELECT RTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
25	21:36:14	SELECT LTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec

Object Info Session

12°C Nebulosa

Buscar Buscar

09:28 a. m. 17/02/2025

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

The screenshot shows the MySQL Workbench interface with a query window containing the following SQL code:

```

49 -- 11. Obtener los primeros 4 caracteres de First_name
50 • SELECT SUBSTRING(First_name, 1, 4) FROM Employee;
51
52 -- 12. Posición de "h" en First_name = "Jhon"
53 • SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon';

```

The results grid displays the following data:

Employee_ID	First_name	Last_name	Salary	Joining_date	Department
1	Bob	Kinto	100000.00	2019-01-20	Finance
2	Jerry	Kansko	600000.00	2019-02-15	IT
3	Philip	Jose	890000.00	2019-02-05	Banking
4	John	Abraham	200000.00	2019-02-23	Insurance
5	Michael	Mathew	220000.00	2019-02-28	Finance
6	Alex	Cheketo	400000.00	2019-05-10	IT
7	Yohan	Soso	123000.00	2019-06-10	Banking

The status bar at the bottom shows the date and time as 09:28 a. m. 17/02/2025.

Figure 3: Obtener todos los empleados

MySQL Workbench

Local instance MySQL80 X

File Edit View Query Database Server Tools Scripting Help

Navigator: Local instance MySQL80

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

Administration Schemas

Information Employee 1 Employee 2 Employee 3 Result 4 Result 5 Employee 6 Result 7 Result 8 Result 9 Result 10 Read Only Context Help Snippets

No object selected

Output:

Action Output

#	Time	Action	Message	Duration / Fetch
20	21:36:14	SELECT UPPER>Last_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
21	21:36:14	SELECT DISTINCT Department FROM Employee LIMIT 0, 1000	4row(s) returned	0.015 sec / 0.000 sec
22	21:36:14	SELECT SUBSTRING(First_name, 1, 4) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
23	21:36:14	SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon' LIMIT 0, 1000	0row(s) returned	0.000 sec / 0.000 sec
24	21:36:14	SELECT RTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
25	21:36:14	SELECT LTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec

Object Info Session

12°C Nebulosa

Buscar Buscar

09:29 a. m. 17/02/2025

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

The screenshot shows the MySQL Workbench interface with a query window containing the following SQL code:

```

49 -- 11. Obtener los primeros 4 caracteres de First_name
50 • SELECT SUBSTRING(First_name, 1, 4) FROM Employee;
51
52 -- 12. Posición de "h" en First_name = "Jhon"
53 • SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon';

```

The results grid displays the following data:

First_name	Last_name
Bob	Kinto
Jerry	Kansko
Philip	Jose
John	Abraham
Michael	Mathew
Alex	Cheketo
Yohan	Soso

The status bar at the bottom shows the date and time as 09:29 a. m. 17/02/2025.

Figure 4: Obtener el primer nombre y apellido de todos los empleados

```

49 -- 11. Obtener los primeros 4 caracteres de First_name
50 • SELECT SUBSTRING(First_name, 1, 4) FROM Employee;
51
52 -- 12. Posición de "h" en First_name = "Jhon"
53 • SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon';

```

Nombre de empleado
Bob
Jerry
John
Michael
Alex
Yohan

Action Output

#	Time	Action	Message	Duration / Fetch
20	21:36:14	SELECT UPPER(Last_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
21	21:36:14	SELECT DISTINCT Department FROM Employee LIMIT 0, 1000	4row(s) returned	0.015 sec / 0.000 sec
22	21:36:14	SELECT SUBSTRING(First_name, 1, 4) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
23	21:36:14	SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon' LIMIT 0, 1000	0row(s) returned	0.000 sec / 0.000 sec
24	21:36:14	SELECT RTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
25	21:36:14	SELECT LTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec

Figure 5: Obtener la columna Firstname con alias

```

49 -- 11. Obtener los primeros 4 caracteres de First_name
50 • SELECT SUBSTRING(First_name, 1, 4) FROM Employee;
51
52 -- 12. Posición de "h" en First_name = "Jhon"
53 • SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon';

```

LOWER(Last_name)
knto
kanxto
jose
abraham
mathew
chrekleto
soso

Action Output

#	Time	Action	Message	Duration / Fetch
20	21:36:14	SELECT UPPER(Last_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
21	21:36:14	SELECT DISTINCT Department FROM Employee LIMIT 0, 1000	4row(s) returned	0.015 sec / 0.000 sec
22	21:36:14	SELECT SUBSTRING(First_name, 1, 4) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
23	21:36:14	SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon' LIMIT 0, 1000	0row(s) returned	0.000 sec / 0.000 sec
24	21:36:14	SELECT RTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
25	21:36:14	SELECT LTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec

Figure 6: Obtener Lastname en minúsculas

MySQL Workbench - Local instance MySQL80

Query 1

```

49 -- 11. Obtener los primeros 4 caracteres de First_name
50 • SELECT SUBSTRING(First_name, 1, 4) FROM Employee;
51
52 -- 12. Posición de "h" en First_name = "Jhon"
53 • SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon';

```

Result Grid

Employee	First_name	Last_name	Upper_Last_name
1	KINTO	KINTO	KINTO
2	JERRY	KANXO	KANXO
3	JOSE	ABRAHAM	ABRAHAM
4	PHILIP	MATHEW	MATHEW
5	CHRISTY	CHREKETO	CHREKETO
6	JOHN	SOSO	SOSO

Action Output

Time	Action	Message	Duration / Fetch
20 21:36:14	SELECT UPPER(Last_name) FROM Employee LIMIT 0, 1000	7 row(s) returned	0.000 sec / 0.000 sec
21 21:36:14	SELECT DISTINCT Department FROM Employee LIMIT 0, 1000	4 row(s) returned	0.015 sec / 0.000 sec
22 21:36:14	SELECT SUBSTRING(First_name, 1, 4) FROM Employee LIMIT 0, 1000	7 row(s) returned	0.000 sec / 0.000 sec
23 21:36:14	SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon' LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec
24 21:36:14	SELECT RTRIM(First_name) FROM Employee LIMIT 0, 1000	7 row(s) returned	0.000 sec / 0.000 sec
25 21:36:14	SELECT LTRIM(First_name) FROM Employee LIMIT 0, 1000	7 row(s) returned	0.000 sec / 0.000 sec

Figure 7: Obtener Lastname en mayúsculas

MySQL Workbench - Local instance MySQL80

Query 1

```

17
18 • INSERT INTO Employee VALUES (1, 'Bob', 'Kinto', 1000000.00, '2019-01-20', 'Finance');
19 • INSERT INTO Employee VALUES (2, 'Jerry', 'Kanxo', 6000000.00, '2019-01-15', 'IT');
20 • INSERT INTO Employee VALUES (3, 'Philip', 'Jose', 8900000.00, '2019-02-05', 'Banking');
21 • INSERT INTO Employee VALUES (4, 'John', 'Abraham', 2000000.00, '2019-02-25', 'Insurance');

```

Result Grid

Employee	First_name	Last_name	Department
1	Bob	Kinto	Finance
2	Jerry	Kanxo	IT
3	Philip	Jose	Banking
4	John	Abraham	Insurance

Action Output

Time	Action	Message	Duration / Fetch
20 21:36:14	SELECT UPPER(Last_name) FROM Employee LIMIT 0, 1000	7 row(s) returned	0.000 sec / 0.000 sec
21 21:36:14	SELECT DISTINCT Department FROM Employee LIMIT 0, 1000	4 row(s) returned	0.015 sec / 0.000 sec
22 21:36:14	SELECT SUBSTRING(First_name, 1, 4) FROM Employee LIMIT 0, 1000	7 row(s) returned	0.000 sec / 0.000 sec
23 21:36:14	SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'Jhon' LIMIT 0, 1000	0 row(s) returned	0.000 sec / 0.000 sec
24 21:36:14	SELECT RTRIM(First_name) FROM Employee LIMIT 0, 1000	7 row(s) returned	0.000 sec / 0.000 sec
25 21:36:14	SELECT LTRIM(First_name) FROM Employee LIMIT 0, 1000	7 row(s) returned	0.000 sec / 0.000 sec

Figure 8: Obtener los nombres únicos de la columna “Departament”

The screenshot shows the MySQL Workbench interface. In the Query Editor (Query 1), the following SQL code is executed:

```

57
58 -- 14. Eliminar espacios en blanco de la izquierda de First_name
59 •  SELECT LTRIM(First_name) FROM Employee;
60
61

```

The Result Grid displays the output of the query:

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
SUBSTRING(First_name, 1, 4)			
Bob			
Jerr			
Phil			
John			
Mich			
Alex			
Yoha			

The Output pane shows the execution log:

Action	Time	Action	Message	Duration / Fetch
20	10:21:45	SELECT UPPER>Last_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
21	10:21:45	SELECT DISTINCT Department FROM Employee LIMIT 0, 1000	4row(s) returned	0.000 sec / 0.000 sec
22	10:21:45	SELECT SUBSTRING(First_name, 1, 4) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
23	10:21:45	SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'John' LIMIT 0, 1000	1row(s) returned	0.000 sec / 0.000 sec
24	10:21:45	SELECT RTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
25	10:21:45	SELECT LTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec

Figure 9: Obtener los primeros 4 caracteres de todos los valores de la columna “Firstname”

The screenshot shows the MySQL Workbench interface. In the Query Editor (Query 1), the following SQL code is executed:

```

57
58 -- 14. Eliminar espacios en blanco de la izquierda de First_name
59 •  SELECT LOCATE('h', First_name) FROM Employee;
60
61

```

The Result Grid displays the output of the query:

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
LOCATE('h', First_name)			
3			

The Output pane shows the execution log:

Action	Time	Action	Message	Duration / Fetch
20	10:21:45	SELECT UPPER>Last_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
21	10:21:45	SELECT DISTINCT Department FROM Employee LIMIT 0, 1000	4row(s) returned	0.000 sec / 0.000 sec
22	10:21:45	SELECT SUBSTRING(First_name, 1, 4) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
23	10:21:45	SELECT LOCATE('h', First_name) FROM Employee WHERE First_name = 'John' LIMIT 0, 1000	1row(s) returned	0.000 sec / 0.000 sec
24	10:21:45	SELECT RTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec
25	10:21:45	SELECT LTRIM(First_name) FROM Employee LIMIT 0, 1000	7row(s) returned	0.000 sec / 0.000 sec

Figure 10: Obtener la posición de la letra “h” en el nombre del empleado con Firstname=“John”

The screenshot shows the MySQL Workbench interface with a query window titled "Query 1". The SQL code is:

```

57
58 -- 14. Eliminar espacios en blanco de la izquierda de First_name
59 • SELECT LTRIM(first_name) FROM Employee;
60
61

```

The result grid displays the output of the query:

	first_name
Bob	
Jerry	
Philip	
John	
Michael	
Alex	
Yohan	

The status bar at the bottom right indicates the date and time: 10/25 a.m. 17/02/2025.

Figure 11: . Obtener todos los valores de la columna “Firstname” después de remover los espacios en blanco de la derecha.

The screenshot shows the MySQL Workbench interface with a query window titled "Query 1". The SQL code is:

```

57
58 -- 14. Eliminar espacios en blanco de la izquierda de First_name
59 • SELECT RTRIM(first_name) FROM Employee;
60
61

```

The result grid displays the output of the query:

	first_name
Bob	Bob
Jerry	Jerry
Philip	Philip
John	John
Michael	Michael
Alex	Alex
Yohan	Yohan

The status bar at the bottom right indicates the date and time: 10:26 a.m. 17/02/2025.

Figure 12: Obtener todos los valores de la columna “Firstname” después de remover los espacios en blanco de la izquierda

Inserción en Álgebra relacional

- $\text{Employee} \leftarrow \text{Employee}(1, \text{'Bob'}, \text{'Kinto'}, 1000000.00, \text{'2019-01-20'}, \text{'Finance'})$
- $\text{Employee} \leftarrow \text{Employee}(2, \text{'Jerry'}, \text{'Kansxo'}, 6000000.00, \text{'2019-01-15'}, \text{'IT'})$
- $\text{Employee} \leftarrow \text{Employee}(3, \text{'Philip'}, \text{'Jose'}, 8900000.00, \text{'2019-02-05'}, \text{'Banking'})$
- $\text{Employee} \leftarrow \text{Employee}(4, \text{'John'}, \text{'Abraham'}, 2000000.00, \text{'2019-02-25'}, \text{'Insurance'})$
- $\text{Employee} \leftarrow \text{Employee}(5, \text{'Michael'}, \text{'Mathew'}, 2200000.00, \text{'2019-02-28'}, \text{'Finance'})$
- $\text{Employee} \leftarrow \text{Employee}(6, \text{'Alex'}, \text{'Chreketo'}, 4000000.00, \text{'2019-05-10'}, \text{'IT'})$
- $\text{Employee} \leftarrow \text{Employee}(7, \text{'Yohan'}, \text{'Soso'}, 1230000.00, \text{'2019-06-10'}, \text{'Banking'})$

Consultas en Álgebra relacional

- $\pi * (\text{Employee})$
- $\pi Firstname, Lastname(\text{Employee})$
- $\rho''\text{"Nombre de empleado"}/Firstname(Firstname(\text{Employee}))$
- $\pi lower(Lastname)(\text{Employee})$
- $\pi upper(Lastname)(\text{Employee})$
- $\delta Department(Department(\text{Employee}))$
- $\pi substring(Firstname, 1, 4)(\text{Employee})$
- $\pi locate('h', Firstname)(Firstname = ' John'(\text{Employee}))$
- $\pi rtrim(Firstname)(\text{Employee})$
- $\pi ltrim(Firstname)(\text{Employee})$

5. Conclusiones

Aunque ya dominaba lo básico de crear una base de datos, tablas y hacer consultas, no tenía muy claro el Álgebra Relacional. Todavía no siento que lo domine al 100 por ciento, pero ahora entiendo un poco más de los conceptos básicos. Seguiré buscando información relacionada al tema para entender mejor.

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