



## Datos Generales:

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**Fecha:** 08/10/2023

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Este laboratorio demuestra cómo usar funciones de base de datos comunes con las cláusulas **GROUP BY** y **OVER**.

Después de completar este laboratorio, podrá realizar lo siguiente:

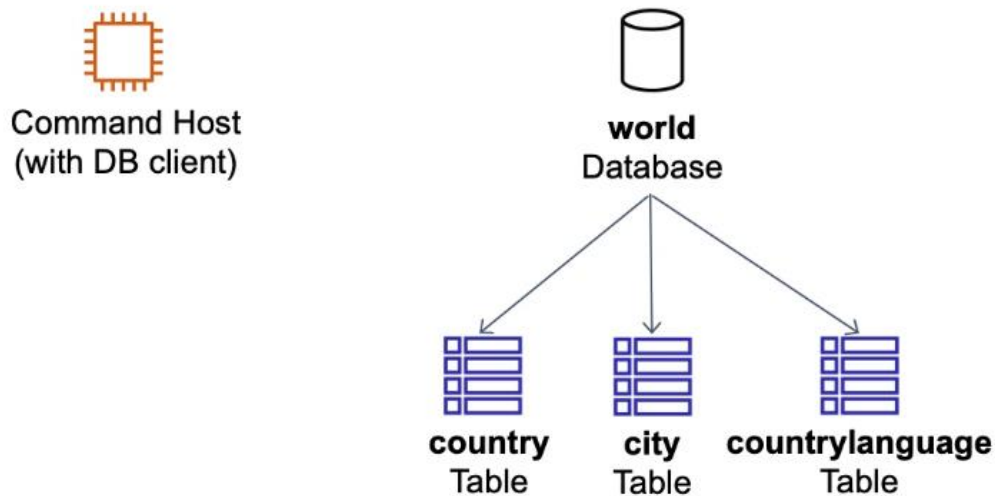
- Usar la cláusula **GROUP BY** con la función **SUM()**
- Usar la cláusula **OVER** con la función de ventana **RANK()**
- Usar la cláusula **OVER** con la función **SUM()** y la función de ventana **RANK()**

## Situación

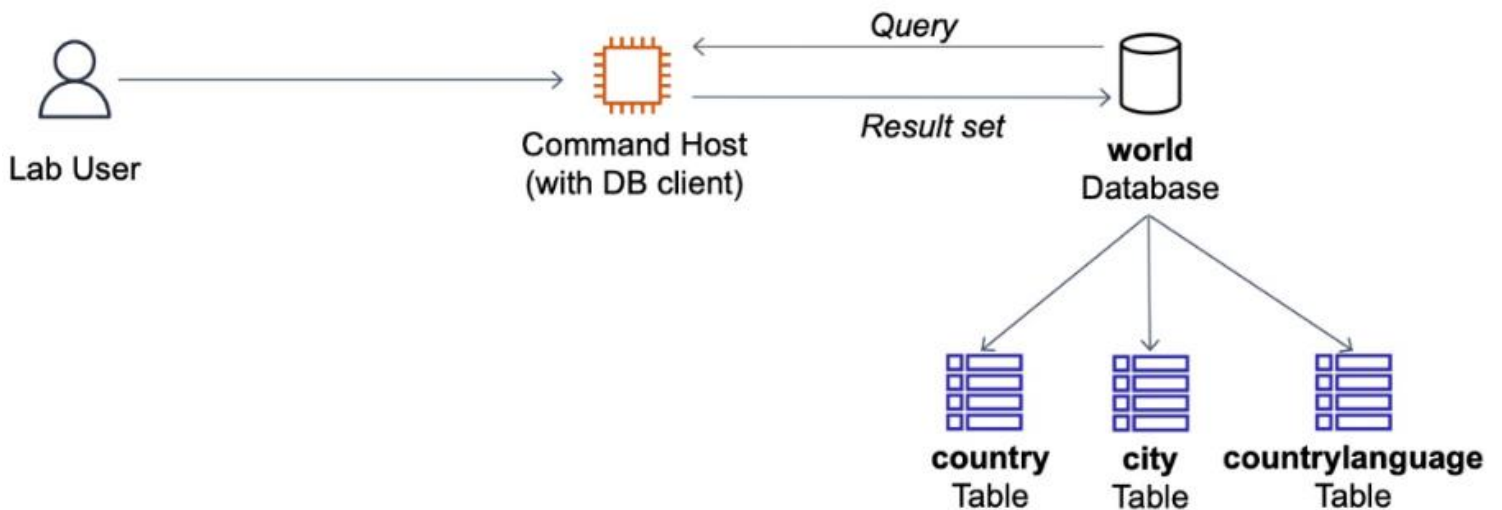
El equipo de operaciones de base de datos creó una base de datos relacional llamada **world** que contiene tres tablas: **city**, **country** y **countrylanguage**. Ayudará a escribir algunas consultas a los registros de grupo para su análisis usando ambas cláusulas **GROUP BY** y **OVER**.

## Entorno de laboratorio:

- Una instancia EC2 (Command Host) con un cliente de base de datos instalado.
- Una base de datos **world** que contiene 3 tablas: **city**, **country**, y **countrylanguage**.



Al final de este laboratorio habrá usado ambas cláusulas **GROUP BY** y **OVER** con algunos operadores de base de datos comunes:

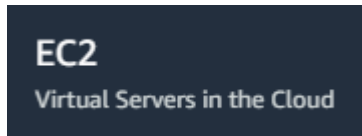


# Tarea 1: Conectarse a Command Host

En esta tarea, se conectará a una instancia de EC2 configurada con un cliente de base de datos (Command Host).

El cliente se usa para ejecutar las queries de SQL contra una base de datos relacional.

**Paso 1:** AWS Management Console → Services → Compute → EC2



**Paso 2:** Instances → Command Host

| <input checked="" type="checkbox"/> | Name ▾       | Instance ID         | Instance state ▾       | Instance type ▾ | Status check                   |
|-------------------------------------|--------------|---------------------|------------------------|-----------------|--------------------------------|
| <input checked="" type="checkbox"/> | Command Host | i-0524ea72e85aedde0 | <span>Running</span> 🔍 | t3.micro        | <span>2/2 checks passed</span> |

**Paso 3:** Command Host → Connect → Session Manager

## Connect to instance [Info](#)

Connect to your instance i-0524ea72e85aedde0 (Command Host) using any of these options


EC2 Instance Connect

**Session Manager**

SSH client

EC2 serial console

Session Manager usage:

- Connect to your instance without SSH keys, a bastion host, or opening any inbound ports.
- Sessions are secured using an AWS Key Management Service key.
- You can log session commands and details in an Amazon S3 bucket or CloudWatch Logs log group.
- Configure sessions on the Session Manager [Preferences](#)  page.

Cancel

Connect

**Paso 4:** Configurar la terminal para acceder a todas las herramientas y recursos necesarios.

```
sudo su  
cd /home/ec2-user/
```

- sudo = ejecutar comandos con privilegios.
- su = cambiar a otro usuario.
- cd = cambiar de directorio.

Session ID: user2741130=Tom\_\_sVillaseca-0ade39e12dc076495

```
sh-4.2$ sudo su  
[root@ip-10-1-11-97 bin]# cd /home/ec2-user/  
[root@ip-10-1-11-97 ec2-user]# pwd  
/home/ec2-user  
[root@ip-10-1-11-97 ec2-user]#
```

**Paso 5:** Conectarse a la base de datos relacional.

```
mysql -u root --password='re:St@rt!9'
```

- mysql = shell SQL para interactuar con los motores de bases de datos.
- -u = nombre de usuario de MySQL
- -p = contraseña de MySQL

Session ID: user2741130=Tom\_\_sVillaseca-0ade39e12dc076495

Instance ID: i-0524ea72e85aedde0

```
[root@ip-10-1-11-97 ec2-user]# mysql -u root --password='re:St@rt!9'  
Welcome to the MariaDB monitor.  Commands end with ; or \g.  
Your MariaDB connection id is 13  
Server version: 10.6.15-MariaDB MariaDB Server  
  
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
MariaDB [(none)]>
```

## Tarea 2: Consulte la base de datos world

En esta tarea, consultará la base de datos **world** usando varias **SELECT** y funciones de la base de datos.

**Paso 1:** Mostrar las bases de datos existentes.

```
SHOW DATABASES;
```

```
MariaDB [(none)]> SHOW DATABASES;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
| world |
+-----+
5 rows in set (0.003 sec)
```

**Paso 2:** Ver el esquema, los datos y la cantidad de filas de la tabla **country**.

```
SHOW COLUMNS FROM world.country; SELECT * FROM world.country;
```

```
MariaDB [(none)]> SHOW COLUMNS FROM world.country;
+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| Code | char(3) | NO | PRI | | |
| Name | char(52) | NO | | | |
| Continent | enum('Asia','Europe','North America','Africa','Oceania','Antarctica','South America') | NO | | Asia | |
| Region | char(26) | NO | | | |
| SurfaceArea | decimal(10,2) | NO | | 0.00 | |
| IndepYear | smallint(6) | YES | | NULL | |
| Population | int(11) | NO | | 0 | |
| LifeExpectancy | decimal(3,1) | YES | | NULL | |
| GNP | decimal(10,2) | YES | | NULL | |
| GNPOld | decimal(10,2) | YES | | NULL | |
| LocalName | char(45) | NO | | | |
| GovernmentForm | char(45) | NO | | | |
| Capital | int(11) | YES | | NULL | |
| Code2 | char(2) | NO | | | |
+-----+-----+-----+-----+-----+
14 rows in set (0.001 sec)
```

**Paso 3:** Realizar una consulta en donde **Region** es “Australia” y “New Zealand” y se encuentre ordenada en base a la columna **Population** en orden descendente.

```
SELECT Region, Name, Population FROM world.country WHERE Region = 'Australia and New Zealand' ORDER By Population desc;
```

```
MariaDB [(none)]> SELECT Region, Name, Population FROM world.cou
+-----+-----+-----+
| Region                | Name                | Populati
+-----+-----+-----+
| Australia and New Zealand | Australia           | 188860
| Australia and New Zealand | New Zealand         | 38620
| Australia and New Zealand | Christmas Island    | 25
| Australia and New Zealand | Norfolk Island      | 20
| Australia and New Zealand | Cocos (Keeling) Islands | 6
+-----+-----+-----+
5 rows in set (0.000 sec)

MariaDB [(none)]> SELECT Region, SUM(Population) FROM world.cou
+-----+-----+
| Region                | SUM(Population) |
+-----+-----+
```

**Paso 4:** Realizar una consulta en donde obtenga el número total de población de las regiones de Australia y New Zealand.

- **Region** es “Australia” y “New Zealand”
- Agrupa ambas regiones en una utilizando **GROUP BY**
- Aplicar la función **SUM()** a los resultados para obtener el número total de población.

```
SELECT Region, SUM(Population) FROM world.country WHERE Region = 'Australia and New Zealand' GROUP By Region ORDER By SUM(Population) desc;
```

```
MariaDB [(none)]> SELECT Region, SUM(Population)
+-----+-----+
| Region                | SUM(Population) |
+-----+-----+
| Australia and New Zealand | 22753100 |
+-----+-----+
1 row in set (0.001 sec)
```

**Paso 5:** Realizar una consulta que utilice la función **OVER()** para agrupar los registros por **Region** y que aplique la función **SUM()** para sumar los registros.

```
SELECT Region, Name, Population, SUM(Population) OVER(partition by Region ORDER BY Population) as 'Running Total' FROM world.country WHERE Region = 'Australia and New Zealand';
```

- El resultado muestra la población de un país junto con el total continuo de la región.

```
MariaDB [(none)]> SELECT Region, Name, Population, SUM(Population) OVER(partition by Region ORDER BY Population) as 'Running Total' FROM world.country WHERE Region = 'Australia and New Zealand';
```

| Region                    | Name                    | Population | Running Total |
|---------------------------|-------------------------|------------|---------------|
| Australia and New Zealand | Cocos (Keeling) Islands | 600        | 600           |
| Australia and New Zealand | Norfolk Island          | 2000       | 2600          |
| Australia and New Zealand | Christmas Island        | 2500       | 5100          |
| Australia and New Zealand | New Zealand             | 3862000    | 3867100       |
| Australia and New Zealand | Australia               | 18886000   | 22753100      |

5 rows in set (0.000 sec)

**Paso 6:** Realizar una consulta que agrupe los registros por **Region** y los ordene por **Population** utilizando la función **OVER()**. Además utilizar la función **RANK()** para generar un número de rango que indica la posición de cada registro en el conjunto de resultados.

```
SELECT Region, Name, Population, SUM(Population) OVER(partition by Region ORDER BY Population) as 'Running Total', RANK() over(partition by region ORDER BY population) as 'Ranked' FROM world.country WHERE region = 'Australia and New Zealand';
```

```
MariaDB [(none)]> SELECT Region, Name, Population, SUM(Population) OVER(partition by Region ORDER BY Population) as 'Running Total', RANK() over(partition by region ORDER BY population) as 'Ranked' FROM world.country WHERE region = 'Australia and New Zealand';
```

| Region                    | Name                    | Population | Running Total | Ranked |
|---------------------------|-------------------------|------------|---------------|--------|
| Australia and New Zealand | Cocos (Keeling) Islands | 600        | 600           | 1      |
| Australia and New Zealand | Norfolk Island          | 2000       | 2600          | 2      |
| Australia and New Zealand | Christmas Island        | 2500       | 5100          | 3      |
| Australia and New Zealand | New Zealand             | 3862000    | 3867100       | 4      |
| Australia and New Zealand | Australia               | 18886000   | 22753100      | 5      |

5 rows in set (0.001 sec)



## Desafió

Describe una consulta para calificar los países en cada región por su población de mayor a menor.

```
SELECT Region, Name, Population, RANK() OVER(partition by Region ORDER BY Population desc) as 'Ranked' FROM world.country order by Region, Ranked;
```

```
MariaDB [(none)]> SELECT Region, Name, Population, RANK() OVER(partition by Region ORDER BY Populat
```

| Region                    | Name   | Population | Ranked |
|---------------------------|--|------------|--------|
| Antarctica                | French Southern territories                  | 0          | 1      |
| Antarctica                | Bouvet Island                                | 0          | 1      |
| Antarctica                | South Georgia and the South Sandwich Islands | 0          | 1      |
| Antarctica                | Antarctica                                   | 0          | 1      |
| Antarctica                | Heard Island and McDonald Islands            | 0          | 1      |
| Australia and New Zealand | Australia                                    | 18886000   | 1      |
| Australia and New Zealand | New Zealand                                  | 3862000    | 2      |
| Australia and New Zealand | Christmas Island                             | 2500       | 3      |
| Australia and New Zealand | Norfolk Island                               | 2000       | 4      |
| Australia and New Zealand | Cocos (Keeling) Islands                      | 600        | 5      |
| Baltic Countries          | Lithuania                                    | 3698500    | 1      |
| Baltic Countries          | Latvia                                       | 2424200    | 2      |
| Baltic Countries          | Estonia                                      | 1439200    | 3      |
| British Islands           | United Kingdom                               | 59623400   | 1      |
| British Islands           | Ireland                                      | 3775100    | 2      |
| Caribbean                 | Cuba   | 11201000   | 1      |
| Caribbean                 | Dominican Republic                           | 8495000    | 2      |
| Caribbean                 | Haiti  | 8222000    | 3      |
| Caribbean                 | Puerto Rico                                  | 3869000    | 4      |
| Caribbean                 | Jamaica                                      | 2583000    | 5      |
| Caribbean                 | Trinidad and Tobago                          | 1295000    | 6      |
| Caribbean                 | Guadeloupe                                   | 456000     | 7      |
| Caribbean                 | Martinique                                   | 395000     | 8      |
| Caribbean                 | Bahamas                                      | 307000     | 9      |
| Caribbean                 | Barbados                                     | 270000     | 10     |

Laboratorio Completado

