Escuela Colombiana de Ingeniería Julio Garavito

Modelos y servicios de datos

Autoestudio #01

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Bogotá
2025

MODELOS Y SERVICIOS DE DATOS
SQL Básico
2025
Autoestudio 1

OBJETIVOS

Desarrollar competencias básicas para escribir consultas simples en SQL

- **Consultas con proyecciones, restricciones y producto cruz**
  SELECT .. FROM .. WHERE ..
- **Dar nuevos nombres**
  AS
- **Resultados sin repeticiones**
  DISTINCT
- **Orden en el resultado de consulta**
  ORDER BY
- **Consultas que requieren agrupamiento**
  GROUP BY ... HAVING ...
- **Operadores para expresiones**
  - *Numéricos*: ABS, ROUND, FLOOR, CEIL, DIV, MOD
  - *Lógicos*: AND, OR, NOT
  - *De comparación*: =, !=, <>, >, <, >=, <=, BETWEEN
  - *Cadenas*: LEN, INSTR, SUBSTR, REPLACE, TRIM, CONCAT, LIKE (%, _)
  - *Tiempo*: CURRENT_DATE, CURRENT_TIMESTAMP, EXTRACT, TO_CHAR
  - *Agrupamiento*: AVG, COUNT, MAX, MIN, SUM
  - *Condicionales*: CASE
  - *Cambio de tipo*: CAST

INVESTIGACIÓN

A. SQL

- **¿Qué es? ¿Para qué sirve?**

  SQL (Structured Query Language) es un lenguaje de programación diseñado específicamente para gestionar y manipular bases de datos relacionales. Su principal función es permitir a los usuarios realizar consultas para recuperar información, modificar datos, definir estructuras de tablas y controlar el acceso a la información. En otras palabras, SQL sirve como un medio de comunicación entre el usuario y el sistema de gestión de bases de datos (DBMS). Gracias a SQL es posible realizar tareas como insertar, eliminar, actualizar registros, así como crear tablas, vistas o relaciones entre los datos.

- **¿Qué es DML, DDL, DCL, TCL?**

  SQL se divide en diferentes subconjuntos de instrucciones, cada uno con un propósito particular:

  DML (Data Manipulation Language): se encarga de la manipulación de los datos. Incluye instrucciones como SELECT, INSERT, UPDATE y DELETE.

  DDL (Data Definition Language): se utiliza para definir y modificar la estructura de la base de datos. Ejemplos de estas sentencias son CREATE, ALTER y DROP.

  DCL (Data Control Language): controla los permisos y la seguridad sobre los datos. Sus principales instrucciones son GRANT y REVOKE.

  TCL (Transaction Control Language): administra las transacciones dentro de la base de datos, garantizando la integridad de la información. Sus comandos más usados son COMMIT, ROLLBACK y SAVEPOINT.

- **En este autoestudio, ¿en qué escribimos? ¿por qué?**

  En este autoestudio escribimos en SQL básico, ya que el objetivo es adquirir destrezas iniciales para construir consultas simples y entender el funcionamiento de las bases de datos relacionales. Se hace de esta manera porque SQL es un estándar en la industria y proporciona las herramientas necesarias para realizar desde consultas sencillas hasta operaciones más complejas de análisis y gestión de datos. Además, dominar SQL es un requisito fundamental para el manejo académico y profesional de información en sistemas informáticos.

B. Motor de bases de datos y bases de datos

- ¿Qué son?
  Los motores de bases de datos son programas esenciales dentro de los sistemas de gestión de bases de datos (DBMS), encargados de almacenar, organizar, manipular y acceder a la información, permitiendo operaciones como crear, leer, actualizar y eliminar datos, además de garantizar su integridad, seguridad y eficiencia en las consultas.

  Por otra parte, una base de datos es una recopilación organizada de información o datos estructurados, que normalmente se almacena de forma electrónica en un sistema informático.

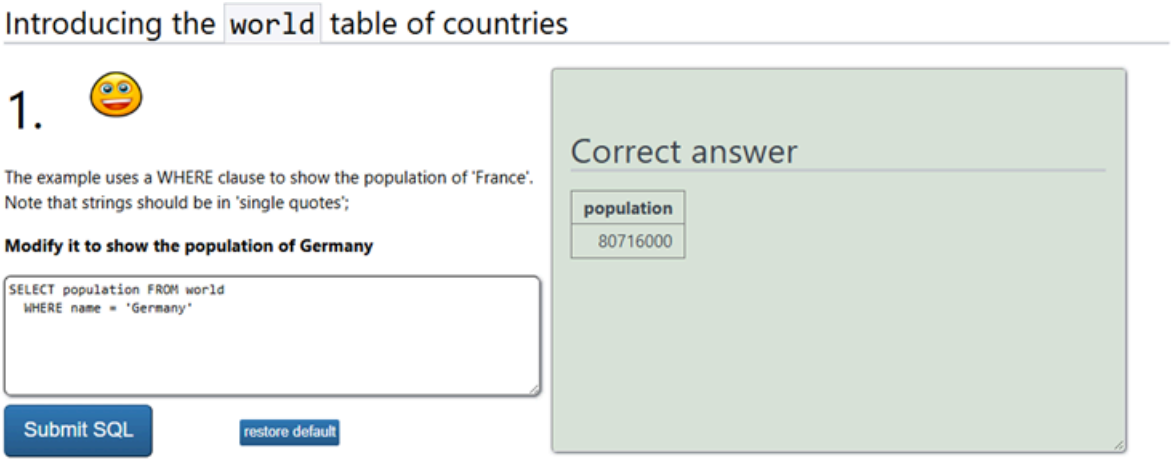
- ¿Qué motores ofrece sqlzoo.net?
  Según la web oficial, los motores que ofrece sqlzoo son: MySQL, Oracle, SQL Server, DB2, Postgres, Mimer, SQLite, Skybase, Access.

- ¿Qué bases de datos ofrece sqlzoo?
  Las más conocidas y usadas son la de World y la de Nobel, en este autoestudio usaremos una muy interesante llamada Musicians.

PRÁCTICA

A. Estudien las siguientes secciones y realicen todos los ejercicios propuestos

SELECT BASICS



Scandinavia

2.

Checking a list The word **IN** allows us to check if an item is in a list. The example shows the name and population for the countries 'Brazil', 'Russia', 'India' and 'China'.

Show the name and the population for 'Sweden', 'Norway' and 'Denmark'.

```
SELECT name, population FROM world
WHERE name IN ('Sweden', 'Norway', 'Denmark');
```

Submit SQL restore default

Correct answer

name	population
Denmark	5634437
Norway	5124383
Sweden	9675885

Just the right size

3.

Which countries are not too small and not too big? `BETWEEN` allows range checking (range specified is inclusive of boundary values). The example below shows countries with an area of 250,000-300,000 sq. km. Modify it to show the country and the area for countries with an area between 200,000 and 250,000.

```
SELECT name, area FROM world
WHERE area BETWEEN 200000 AND 250000;
```

Submit SQL restore default

Correct answer

name	area
Belarus	207600
Ghana	238533
Guinea	245857
Guyana	214969
Laos	236800
Romania	238391
Uganda	241550

SELECT NAMES

1.

You can use `WHERE name LIKE 'B%'` to find the countries that start with "B".

- The % is a *wild-card* it can match any characters

Find the country that start with Y

```
SELECT name
FROM world
WHERE name LIKE 'Y%';
```

Submit SQL restore default

Correct answer

name
Yemen

2.

Find the countries that end with y

```
SELECT name FROM world
WHERE name LIKE '%y';
```

Submit SQL restore default

Correct answer

name
Turkey
Germany
Hungary
Italy
Norway
Vatican City
Paraguay

3.

Luxembourg has an **x** - so does one other country. List them both.

Find the countries that contain the letter x

```
SELECT name FROM world
WHERE name LIKE '%x%';
```

Submit SQL restore default

Correct answer

name
Luxembourg
Mexico

4.

Iceland, Switzerland end with **land** - but are there others?

Find the countries that end with land

```
SELECT name FROM world
WHERE name LIKE '%land';
```

Submit SQL restore default

Correct answer

name
Swaziland
Thailand
Finland
Iceland
Ireland
Poland
Switzerland

5.

Columbia starts with a **C** and ends with **ia** - there are two more like this.

Find the countries that start with C and end with ia

```
SELECT name FROM world
WHERE name LIKE 'C%ia';
```

Submit SQL restore default

Correct answer

name
Cambodia
Colombia
Croatia

6.

Greece has a double **e** - who has a double **o**?

Find the country that has oo in the name

```
SELECT name FROM world
WHERE name LIKE '%oo%';
```

Submit SQL restore default

Correct answer

name
Cameroon

7.

Bahamas has three **a** - who else?

Find the countries that have three or more a in the name

```
SELECT name FROM world
WHERE name LIKE '%a%a%a%';
```

Submit SQL restore default

Correct answer

name
Central African Republic
Equatorial Guinea
Madagascar
Mauritania
Sao TomÃ© and PrÃncipe
Tanzania
Afghanistan

8.

India and Angola have an **n** as the second character. You can use the underscore as a single character wildcard.

```
SELECT name FROM world
 WHERE name LIKE '_n%'
ORDER BY name
```

Find the countries that have "t" as the second character.

```
SELECT name FROM world
WHERE name LIKE '_t%'
ORDER BY name;
```

Correct answer

name
Ethiopia
Italy

9.

Les**o**th**o** and M**o**ld**o**va both have two o characters separated by two other characters.

Find the countries that have two "o" characters separated by two others.

```
SELECT name FROM world
WHERE name LIKE '%o__o%';
```

Submit SQL restore default

Correct answer

name
Congo, Democratic Republic of
Congo, Republic of
Lesotho
Morocco
Sao TomÃ© and PrÃncipe
Mongolia
Moldova

10.

Cuba and Togo have four characters names.

Find the countries that have exactly four characters.

```
SELECT name FROM world
WHERE name LIKE '____';
```

Submit SQL restore default

Correct answer

name
Chad
Mali
Togo
Iran
Iraq
Laos
Oman

SELECT FROM WORLD

Introduction

1.

Read the notes about this table. Observe the result of running this SQL command to show the name, continent and population of all countries.

```
SELECT name, continent, population FROM world
```

Submit SQL restore default

Correct answer

name	continent	population
Afghanistan	Asia	25500100
Albania	Europe	2821977
Algeria	Africa	38700000
Andorra	Europe	76098
Angola	Africa	19183590
Antigua and Barbuda	Caribbean	86295
Argentina	South America	42669500

Large Countries

2.

How to use WHERE to filter records. Show the name for the countries that have a population of at least 200 million. 200 million is 200000000, there are eight zeros.

```
SELECT name FROM world
WHERE population >= 200000000;
```

Submit SQL restore default

Correct answer

name
Brazil
China
India
Indonesia
United States

Per capita GDP

3.

Give the `name` and the **per capita GDP** for those countries with a `population` of at least 200 million.

HELP:How to calculate per capita GDP

per capita GDP is the GDP divided by the population GDP/population

```
SELECT name, gdp/population AS per_capita_gdp FROM world
WHERE population >= 200000000;
```

Submit SQL restore default

Correct answer

name	per_capita_gdp
Brazil	11115.2648
China	6121.7106
India	1504.7931
Indonesia	3482.0205
United States	51032.2945

South America In millions

4.

Show the `name` and `population` in millions for the countries of the `continent` 'South America'. Divide the population by 1000000 to get population in millions.

```
SELECT name, population/1000000 AS population_millions FROM world
WHERE continent = 'South America';
```

Submit SQL restore default

Correct answer

name	population_millions
Argentina	42.6695
Bolivia	10.0273
Brazil	202.7940
Chile	17.7730
Colombia	47.6620
Ecuador	15.7742
Guyana	0.7849

France, Germany, Italy

5.

Show the `name` and `population` for France, Germany, Italy

```
SELECT name, population FROM world
WHERE name IN ('France', 'Germany', 'Italy');
```

Submit SQL restore default

Correct answer

name	population
France	65906000
Germany	80716000
Italy	60782668

United

6.

Show the countries which have a `name` that includes the word 'United'

```
SELECT name FROM world
WHERE name LIKE '%United%';
```

Submit SQL restore default

Correct answer

name
United Arab Emirates
United Kingdom
United States

Two ways to be big

7.

Two ways to be big: A country is **big** if it has an area of more than 3 million sq km or it has a population of more than 250 million.

Show the countries that are big by area or big by population. Show name, population and area.

```
SELECT name, population, area FROM world
WHERE area > 3000000
   OR population > 250000000;
```

Submit SQL restore default

Correct answer

name	population	area
Australia	23545500	7692024
Brazil	202794000	8515767
Canada	35427524	9984670
China	1365370000	9596961
India	1246160000	3166414
Indonesia	252164800	1904569
Russia	146000000	17125242

One or the other (but not both)

8.

Exclusive OR (XOR). Show the countries that are big by area (more than 3 million) or big by population (more than 250 million) but not both. Show name, population and area.

- Australia has a big area but a small population, it should be **included**.
- Indonesia has a big population but a small area, it should be **included**.
- China has a big population **and** big area, it should be **excluded**.
- United Kingdom has a small population and a small area, it should be **excluded**.

```
SELECT name, population, area FROM world
WHERE (area > 3000000 AND population <= 250000000)
   OR (population > 250000000 AND area <= 3000000);
```

Submit SQL restore default

Correct answer

name	population	area
Australia	23545500	7692024
Brazil	202794000	8515767
Canada	35427524	9984670
Indonesia	252164800	1904569
Russia	146000000	17125242

Rounding

9.

Show the `name` and `population` in millions and the GDP in billions for the countries of the `continent` 'South America'. Use the ROUND function to show the values to two decimal places.

For Americas show population in millions and GDP in billions both to 2 decimal places.

Millions and billions

Missing decimals

```
SELECT name,
       ROUND(population/1000000.0, 2) AS population_millions,
       ROUND(gdp/1000000000.0, 2) AS gdp_billions
FROM world
WHERE continent = 'South America';
```

Submit SQL restore default

Correct answer

name	population_millions	gdp_billions
Argentina	42.67	477.03
Bolivia	10.03	27.04
Brazil	202.79	2254.11
Chile	17.77	268.31
Colombia	47.66	369.81
Ecuador	15.77	87.50
Guyana	0.78	2.85

Trillion dollar economies

10.

Show the `name` and per-capita GDP for those countries with a GDP of at least one trillion (1000000000000; that is 12 zeros). Round this value to the nearest 1000.

Show per-capita GDP for the trillion dollar countries to the nearest $1000.

```
SELECT name,
       ROUND(gdp/population, -3) AS per_capita_gdp
FROM world
WHERE gdp >= 1000000000000;
```

Submit SQL restore default

Correct answer

name	per_capita_gdp
Australia	66000
Brazil	11000
Canada	45000
China	6000
France	40000
Germany	42000
India	2000

Name and capital have the same length

11.

Greece has capital Athens.

Each of the strings 'Greece', and 'Athens' has 6 characters.

Show the name and capital where the name and the capital have the same number of characters.

- You can use the LENGTH function to find the number of characters in a string

For Microsoft SQL Server the function LENGTH is LEN

```
SELECT name, capital FROM world
WHERE LENGTH(name) = LENGTH(capital);
```

Submit SQL restore default

Correct answer

name	capital
Algeria	Algiers
Angola	Luanda
Armenia	Yerevan
Botswana	Gaborone
Canada	Ottowa
Djibouti	Djibouti
Egypt	Cairo

Matching name and capital

12.

The capital of Sweden is Stockholm. Both words start with the letter 'S'.

Show the name and the capital where the first letters of each match. Don't include countries where the name and the capital are the same word.

- You can use the function LEFT to isolate the first character.
- You can use `<>` as the **NOT EQUALS** operator.

```
SELECT name, capital
FROM world
WHERE LEFT(name,1) = LEFT(capital,1)
  AND name <> capital;
```

Submit SQL restore default

Correct answer

name	capital
Algeria	Algiers
Andorra	Andorra la Vella
Barbados	Bridgetown
Belize	Belmopan
Brazil	BrasÃlia
Brunei	Bandar Seri Begawan
Burundi	Bujumbura

All the vowels

13.

Equatorial Guinea and **Dominican Republic** have all of the vowels (a e i o u) in the name. They don't count because they have more than one word in the name.

Find the country that has all the vowels and no spaces in its name.

- You can use the phrase `name NOT LIKE '%a%'` to exclude characters from your results.
- The query shown misses countries like Bahamas and Belarus because they contain at least one 'a'

```
SELECT name FROM world
WHERE name LIKE '%a%'
  AND name LIKE '%e%'
  AND name LIKE '%i%'
  AND name LIKE '%o%'
  AND name LIKE '%u%'
  AND name NOT LIKE '% %';
```

Submit SQL restore default

Correct answer

name
Mozambique

SELECT FROM NOBEL

Winners from 1950

1.

Change the query shown so that it displays Nobel prizes for 1950.

```
SELECT * FROM nobel
WHERE yr = 1950;
```

Submit SQL restore default

Correct answer

yr	subject	winner
1950	chemistry	Kurt Alder
1950	chemistry	Otto Diels
1950	literature	Bertrand Russell
1950	medicine	Edward Kendall
1950	medicine	Philip Hench
1950	medicine	Tadeus Reichstein
1950	peace	Ralph Bunche

1962 Literature

2.

Show who won the 1962 prize for literature.

```
SELECT winner FROM nobel
WHERE yr = 1962
  AND subject = 'Literature';
```

Submit SQL restore default

Correct answer

winner
John Steinbeck

Albert Einstein

3.

Show the year and subject that won 'Albert Einstein' his prize.

```
SELECT yr, subject FROM nobel
WHERE winner = 'Albert Einstein';
```

Submit SQL restore default

Correct answer

yr	subject
1921	physics

Recent Peace Prizes

4.

Give the name of the 'peace' winners since the year 2000, including 2000.

```
SELECT winner FROM nobel
WHERE subject = 'Peace'
  AND yr >= 2000;
```

Submit SQL restore default

Correct answer

winner
Kim Dae-jung
Kofi Annan
United Nations
Jimmy Carter
Shirin Ebadi
Wangari Maathai
International Atomic Energy Agency

Literature in the 1980's

5.

Show all details (**yr**, **subject**, **winner**) of the literature prize winners for 1980 to 1989 inclusive.

```
SELECT * FROM nobel
WHERE subject = 'Literature'
  AND yr BETWEEN 1980 AND 1989;
```

Submit SQL restore default

Correct answer

yr	subject	winner
1980	literature	Czes?aw Mi?osz
1981	literature	Elias Canetti
1982	literature	Gabriel García Márquez
1983	literature	William Golding
1984	literature	Jaroslav Seifert
1985	literature	Claude Simon
1986	literature	Wole Soyinka

Only Presidents

6. 

Show all details of the presidential winners:

- Theodore Roosevelt
- Thomas Woodrow Wilson
- Jimmy Carter
- Barack Obama

```
SELECT * FROM nobel
WHERE winner IN ('Theodore Roosevelt', 'Thomas Woodrow Wilson', 'Jimmy Carter',
'Barack Obama');
```

Submit SQL restore default

Correct answer

yr	subject	winner
1906	peace	Theodore Roosevelt
2002	peace	Jimmy Carter
2009	peace	Barack Obama

John

7. 

Show the winners with first name John

```
SELECT winner FROM nobel
WHERE winner LIKE 'John %';
```

Submit SQL restore default

Correct answer

winner
John Macleod
John Galsworthy
John Northrop
John Mott
John Cockcroft
John Enders
John Bardeen

Chemistry and Physics from different years

8. 

Show the year, subject, and name of physics winners for 1980 together with the chemistry winners for 1984.

```
SELECT yr, subject, winner FROM nobel
WHERE (subject = 'Physics' AND yr = 1980)
   OR (subject = 'Chemistry' AND yr = 1984);
```

Submit SQL restore default

Correct answer

yr	subject	winner
1980	physics	James Cronin
1980	physics	Val Fitch
1984	chemistry	Bruce Merrifield

Exclude Chemists and Medics

9. 

Show the year, subject, and name of winners for 1980 excluding chemistry and medicine

```
SELECT yr, subject, winner FROM nobel
WHERE yr = 1980
  AND subject NOT IN ('Chemistry', 'Medicine');
```

Submit SQL restore default

Correct answer

yr	subject	winner
1980	literature	Czes?aw Mi?osz
1980	peace	Adolfo Pérez Esquivel
1980	physics	James Cronin
1980	physics	Val Fitch

Early Medicine, Late Literature

10.

Show year, subject, and name of people who won a 'Medicine' prize in an early year (before 1910, not including 1910) together with winners of a 'Literature' prize in a later year (after 2004, including 2004)

```
SELECT yr, subject, winner FROM nobel
WHERE (subject = 'Medicine' AND yr < 1910)
   OR (subject = 'Literature' AND yr >= 2004);
```

Submit SQL restore default

Correct answer

yr	subject	winner
1901	medicine	Emil von Behring
1902	medicine	Ronald Ross
1903	medicine	Niels Ryberg Finsen
1904	medicine	Ivan Pavlov
1905	medicine	Robert Koch
1906	medicine	Camillo Golgi
1906	medicine	Santiago Ramón y Cajal

SELECT WITHIN SELECT

Bigger than Russia

1.

List each country name where the population is larger than that of 'Russia'.

```
world(name, continent, area, population, gdp)
```

```
SELECT name FROM world
WHERE population > (SELECT population
                    FROM world
                    WHERE name = 'Russia');
```

Submit SQL restore default

Correct answer

name
Bangladesh
Brazil
China
India
Indonesia
Nigeria
Pakistan

Richer than UK

2.

Show the countries in Europe with a per capita GDP greater than 'United Kingdom'.

Per Capita GDP

```
SELECT name
FROM world
WHERE continent = 'Europe'
  AND (gdp / population) > (SELECT gdp / population
                            FROM world
                            WHERE name = 'United Kingdom');
```

Submit SQL restore default

Correct answer

name
Andorra
Austria
Belgium
Denmark
Finland
France
Germany

Neighbours of Argentina and Australia

3.

List the name and continent of countries in the continents containing either Argentina or Australia. Order by name of the country.

```
SELECT name, continent FROM world
WHERE continent IN (SELECT continent
                    FROM world
                    WHERE name IN ('Argentina', 'Australia'))
ORDER BY name;
```

Submit SQL restore default

Correct answer

name	continent
Argentina	South America
Australia	Oceania
Bolivia	South America
Brazil	South America
Chile	South America
Colombia	South America
Ecuador	South America

Between Canada and Poland

4.

Which country has a population that is more than United Kingdom but less than Germany? Show the name and the population.

```
SELECT name, population
FROM world
WHERE population > (SELECT population FROM world WHERE name = 'United Kingdom')
  AND population < (SELECT population FROM world WHERE name = 'Germany');
```

Submit SQL restore default

Correct answer

name	population
Congo, Democratic Republic of	69360000
France	65906000
Iran	77552000
Thailand	64456700
Turkey	76667864

Percentages of Germany

5.

Germany (population roughly 80 million) has the largest population of the countries in Europe. Austria (population 8.5 million) has 11% of the population of Germany.

Show the name and the population of each country in Europe. Show the population as a percentage of the population of Germany.

The format should be *Name, Percentage* for example:

name	percentage
Albania	3%
Andorra	0%
Austria	11%
...	...

Decimal places

Percent symbol %

```
SELECT name,
       CONCAT(ROUND(population * 100.0 / (SELECT population FROM world WHERE
name = 'Germany')), '%') AS percentage
FROM world
WHERE continent = 'Europe'
ORDER BY name;
```

Submit SQL restore default

Correct answer

name	percentage
Albania	3%
Andorra	0%
Austria	11%
Belarus	12%
Belgium	14%
Bosnia and Herzegovina	5%
Bulgaria	9%

Bigger than every country in Europe

6.

Which countries have a GDP greater than every country in Europe? [Give the name only.] (Some countries may have NULL gdp values)

```
SELECT name
FROM world
WHERE gdp > ALL (SELECT gdp
                 FROM world
                 WHERE continent = 'Europe' AND gdp IS NOT NULL);
```

Submit SQL restore default

Correct answer

name
China
Japan
United States

Largest in each continent

7.

Find the largest country (by area) in each continent, show the continent, the name and the area:

The above example is known as a **correlated** or **synchronized** sub-query.

Using correlated subqueries

```
SELECT continent, name, area
FROM world w1
WHERE area = (SELECT MAX(area)
              FROM world w2
              WHERE w2.continent = w1.continent);
```

Submit SQL restore default

Correct answer

continent	name	area
Africa	Algeria	2381741
Oceania	Australia	7692024
South America	Brazil	8515767
North America	Canada	9984670
Asia	China	9596961
Caribbean	Cuba	109884
Europe	Kazakhstan	2724900

First country of each continent (alphabetically)

8.

List each continent and the name of the country that comes first alphabetically.

```
SELECT continent, name
FROM world w1
WHERE name = (SELECT MIN(name)
              FROM world w2
              WHERE w2.continent = w1.continent);
```

Submit SQL restore default

Correct answer

continent	name
Africa	Algeria
Asia	Afghanistan
Caribbean	Antigua and Barbuda
Eurasia	Armenia
Europe	Albania
North America	Belize
Oceania	Australia

SUM AND COUNT

Total world population

1.

Show the total **population** of the world.

```
world(name, continent, area, population, gdp)
```

```
SELECT SUM(population) AS total_population
FROM world;
```

Submit SQL restore default

Correct answer

total_population
7118632738

List of continents

2.

List all the continents - just once each.

```
SELECT DISTINCT continent
FROM world;
```

Submit SQL restore default

Correct answer

continent
Africa
Asia
Caribbean
Eurasia
Europe
North America
Oceania

GDP of Africa

3.

Give the total GDP of Africa

```
SELECT SUM(gdp) AS total_gdp
FROM world
WHERE continent = 'Africa';
```

Submit SQL restore default

Correct answer

total_gdp
1811788000000

Count the big countries

4.

How many countries have an **area** of at least 1000000

```
SELECT COUNT(*) AS big_countries
FROM world
WHERE area >= 1000000;
```

Submit SQL restore default

Correct answer

big_countries
29

Baltic states population

5.

What is the total **population** of ('Estonia', 'Latvia', 'Lithuania')

```
SELECT SUM(population) AS total_population
FROM world
WHERE name IN ('Estonia', 'Latvia', 'Lithuania');
```

Submit SQL restore default

Correct answer

total_population
6251750

Using GROUP BY and HAVING

You may want to look at these examples: Using GROUP BY and HAVING.

Counting the countries of each continent

6.

For each **continent** show the **continent** and number of countries.

```
SELECT continent, COUNT(*) AS number_of_countries
FROM world
GROUP BY continent;
```

Submit SQL restore default

Correct answer

continent	number_of_countries
Africa	53
Asia	47
Caribbean	11
Eurasia	2
Europe	44
North America	11
Oceania	14

Counting big countries in each continent

7.

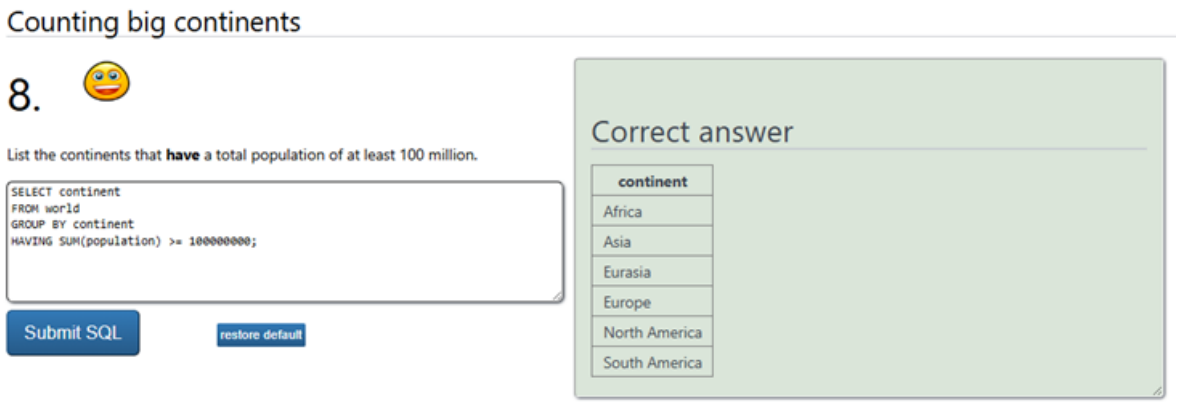
For each **continent** show the **continent** and number of countries with populations of at least 10 million.

```
SELECT continent, COUNT(*) AS big_countries
FROM world
WHERE population >= 10000000
GROUP BY continent;
```

Submit SQL restore default

Correct answer

continent	big_countries
Africa	29
Asia	26
Caribbean	2
Eurasia	1
Europe	14
North America	4
Oceania	1



B. Seleccionen cinco consultas y escríbalas en cálculo o en álgebra.

Consulta 1

SQL:

SELECT name FROM world

WHERE population >= 200000000;

Álgebra relacional:

π_name (σ_population ≥ 200000000 (world))

Cálculo relacional (tuplas):

{ w.name | w ∈ world ∧ w.population ≥ 200000000 }

Consulta 2

SQL:

SELECT name, population FROM world

WHERE name IN ('France', 'Germany', 'Italy');

Álgebra relacional:

π_name, population (σ_name = 'France' ∨ name = 'Germany' ∨ name = 'Italy' (world))

Cálculo relacional (tuplas):

{ w.name, w.population | w ∈ world ∧ (w.name = 'France' ∨ w.name = 'Germany' ∨ w.name = 'Italy') }

Consulta 3

SQL:

SELECT name, continent, population FROM world;

Álgebra relacional:

π_name, continent, population (world)

Cálculo relacional (tuplas):

{ w.name, w.continent, w.population | w ∈ world }

Consulta 4

SQL:

SELECT * FROM nobel

WHERE yr = 1950;

Álgebra relacional:

σ_yr = 1950 (nobel)

Cálculo relacional (tuplas):

{ n | n ∈ nobel ∧ n.yr = 1950 }

Consulta 5

SQL:

SELECT yr, subject FROM nobel

WHERE winner = 'Albert Einstein';

Álgebra relacional:

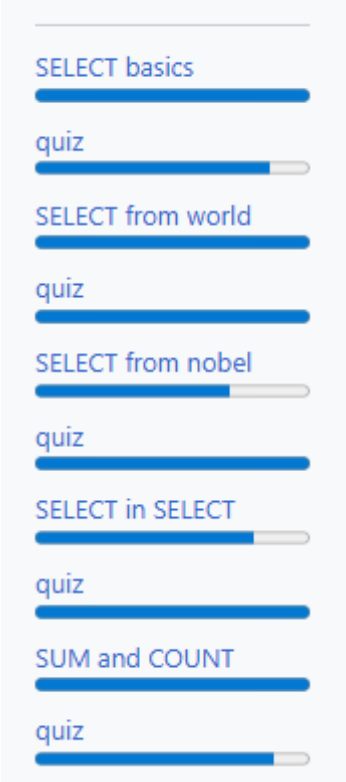
π_yr, subject (σ_winner = 'Albert Einstein' (nobel))

Cálculo relacional (tuplas):

{ n.yr, n.subject | n ∈ nobel ∧ n.winner = 'Albert Einstein'

C. Presente los quices. Utilice el motor MySQL.

[Escriban el resultado obtenido de los quices]



SELECT QUIZ

Your score is: 6 out of 7

BBC QUIZ

Your score is: 7 out of 7

Retrieved from "https://sqlzoo.net/w/index.php?title=BBC_QUIZ&oldid=14195"

NOBEL QUIZ

Your score is: 7 out of 7

Retrieved from "https://sqlzoo.net/w/index.php?title=Nobel_Quiz&oldid=39728"

NESTED SELECT QUIZ

Your score is: 7 out of 7

Retrieved from "https://sqlzoo.net/w/index.php?title=Nested_SELECT_Quiz&oldid=39733"

SUM AND COUNT QUIZ

Score: 7/8

B. Proponga tres consultas que usen tres funciones diferentes.

1. Mostrar cuántas letras tiene el nombre de cada banda.

```
SELECT band_name, LENGTH(band_name) AS longitud
FROM band;
```

Submit SQL restore default

band_name	longitud
ROP	3
AASO	4
The J Bs	8
BBSO	4
The left Overs	14
Somebody Loves this	19
Oh well	7
Swinging strings	16
The Rest	8

2. Mostrar en qué año se fundó cada banda.

```
SELECT band_name, YEAR(b_date) AS año_fundacion
FROM band;
```

Submit SQL restore default

band_name	año_fundacion
ROP	1930
AASO	null
The J Bs	null
BBSO	null
The left Overs	null
Somebody Loves this	null
Oh well	null
Swinging strings	null
The Rest	null

3. Mostrar con una frase a qué género pertenece cada banda.

```
SELECT CONCAT(band_name, ' es del genero de musica ', band_type) AS genero
FROM band;
```

Submit SQL restore default

genero
ROP es del genero de musica classical
AASO es del genero de musica classical
The J Bs es del genero de musica jazz
BBSO es del genero de musica classical
The left Overs es del genero de musica jazz
Somebody Loves this es del genero de musica jazz
Oh well es del genero de musica classical
Swinging strings es del genero de musica classical
The Rest es del genero de musica jazz

C. Propongan tres consultas una para cada esquema : 1) GROUP BY ... HAVING ... 2) ORDER BY 3) DISTINCT.

1. Qué tipos de banda tienen más de cuatro bandas.

```
SELECT band_type, COUNT(*) AS total
FROM band
GROUP BY band_type
HAVING COUNT(*) > 4;
```

Submit SQL restore default

Result:

band_type	total
classical	5

2. Ordenar el nombre de las bandas alfabéticamente.

```
SELECT band_name
FROM band
ORDER BY band_name ASC;
```

Submit SQL restore default

band_name
AASO
BBSO
Oh well
ROP
Somebody Loves this
Swinging strings
The J Bs
The left Overs
The Rest

3. Mostrar el origen de cada banda sin repetir (hay 2 bandas que tienen un valor de 4 y 9 en band_home).

```
SELECT DISTINCT band_home
FROM band
ORDER BY band_home;
```

Submit SQL restore default

Result:

band_home
1
2
4
5
6
8
9

REFERENCIAS
https://ebits.cl/blog/que-son-los-motores-de-bases-de-datos/
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