**MODELOS Y BASES DE DATOS**

**SQL Básico**

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**Autoestudio 1**

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**TEORICA**

1. **SQL**

* ¿Qué es SQL?
* El Lenguaje de Consulta Estructurado popularmente conocido por sus siglas en inglés como SQL, es un tipo de lenguaje de programación que ayuda a solucionar problemas específicos o relacionados con la definición, manipulación e integridad de la información representada por los datos que se almacenan en las bases de datos.

Algunos aspectos de SQL están basados en el cálculo relacional, algunos en el álgebra relacional que provienen del modelo relacional y otros a ninguno de los dos, sino que son parte de SQL

* ¿Qué es DML, DLL,DCL,TCL?
* **DDL (Data Definition Language):** Permite crear y modificar la estructura de una base de datos.

CREATE: Utilizado para crear nuevas tablas, campos e índices.

ALTER: Utilizado para modificar las tablas agregando campos o cambiando la definición de los campos.

DROP: Empleado para eliminar tablas e índices.

TRUNCATE: Empleado para eliminar todos los registros de una tabla.

COMMENT: Utilizado para agregar comentarios al diccionario de datos.

RENAME: Tal como su nombre lo indica es utilizado para renombrar objetos.

* **DML (Data Manipulation Language):** Permite recuperar, almacenar, modificar, eliminar, insertar y actualizar datos de una base de datos.

SELECT: Utilizado para consultar registros de la base de datos que satisfagan un criterio determinado.

INSERT: Utilizado para cargar de datos en la base de datos en una única operación.

UPDATE: Utilizado para modificar los valores de los campos y registros especificados

DELETE: Utilizado para eliminar registros de una tabla de una base de datos.

* **DCL (Data Control Language):** Permite crear roles, permisos e integridad referencial, así como el control al acceso a la base de datos.

GRANT: Usado para otorgar privilegios de acceso de usuario a la base de datos.

REVOKE: Utilizado para retirar privilegios de acceso otorgados con el comando GRANT.

* **TCL (Transactional Control Language):** Permite administrar diferentes transacciones que ocurren dentro de una base de datos.

COMMIT: Empleado para guardar el trabajo hecho.

ROLLBACK: Utilizado para deshacer la modificación que hice desde el último COMMIT

1. **Motor de bases de datos y bases de datos**
   * **¿Qué son?**

* **Motor de base de datos** es el servicio principal para almacenar, procesar y proteger los datos. ... Se pueden crear tablas para almacenar datos y objetos de base de datos como índices, vistas y procedimientos almacenados para ver, administrar y proteger los datos.
* Una **base de datos** es un conjunto de datos pertenecientes a un mismo contexto y almacenados sistemáticamente para su posterior uso. En este sentido; una biblioteca puede considerarse una base de datos compuesta en su mayoría por documentos y textos impresos en papel e indexados para su consulta.
* ¿Qué motores ofrece sqlzoo.net [http://sqlzoo.net/]?
* Ofrece motores como: SQL Server, Oracle, MySQL, DB2, and PostgreSQL.
* ¿Qué bases de datos ofrece sqlzoo?
* Tablas

**Bibliografía**

* Araujo, 2018. ¿Qué es DDL, DML, DCL y TCL? Obtenido de: <https://platzi.com/blog/que-es-ddl-dml-dcl-y-tcl-integridad-referencial/>
* Ramos, 2018. ¿Qué es y para qué sirve SQL? Obtenido de: <https://styde.net/que-es-y-para-que-sirve-sql/>

**PRACTICA**

**A.**

**SELECT…FROM**

SELECT continente FROM world

**SELECT…FROM…WHERE**

SELECT name FROM world

WHERE continent=’Asia’

**GROUP BY…HAVING**

SELECT continent, SUM(area) FROM world

GROUP BY continent

HAVING SUM(area)>100000000

**ORDER BY**

SELECT name, yr FROM nobel

WHERE yr BETWEEN 1980 AND 2000

ORDER BY desc

**DISTINCT**

SELECT DISTINC subject FROM nobel

**AS**

SELECT continente SUM(area)

AS TotalArea FROM world

GROUP BY continent

**SELECT…SELECT**

SELECT name, continente FROM world

WHERE name IN (SELECT name FROM world

WHERE continent)

**B.**

**¿Qué información tiene la tabla WORLD?**

**●** Calculo relacional: {x : world| : x}

● Algebra relacional: Πcolumnas world

● SQL: SELECT \* FROM world

**¿Qué continentes figuran en esa tabla? (Sin repeticiones)**

**●** Calculo relacional: {x : world| :continent}

● Algebra relacional: Πcontinent world

● SQL: SELECT DISTINCT continent FROM world

**¿Qué países tienen un área menor a 1000? (ordenados de mayor a menor)**

**●** Calculo relacional: {x : world | area>500 : country}

● Algebra relacional: Πcountry σ area>500 world

● SQL: SELECT name FROM world

WHERE area>500

ORDER BY name desc

**¿Qué continentes tienen países con una población mayor**

**a quinientos mil de habitantes? (ordenados de mayor a menor)**

**●** Calculo relacional: {x : world | population>1000000: continent}

● Algebra relacional: Πcontinent σ population>1000000 world

● SQL: SELECT continent FROM world

WHERE population > 1000000

ORDER BY population asc

**¿Qué área tiene cada una de los continentes?**

**●** Calculo relacional: {x : world| : continente,area}

● Algebra relacional: Πcontinente,area world

● SQL: SELECT continente,area FROM world

GROUP BY continente

**¿Cuál es la población total?**

**●** Calculo relacional: {x : world| : sum(population)}

● Algebra relacional: Πsum(population) world

● SQL: SELECT SUM(population) FROM world

**¿De cuántos países se tiene información?**

**●** Calculo relacional: {x : world| : count(name) }

● Algebra relacional: Πcount(name) World

● SQL: SELECT COUNT (name) FROM world

**C.**

**0. Select basic**

**Modify it to show the population of Germany**

SELECT population FROM world

WHERE name = 'Germany'

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

SELECT name, population FROM world

WHERE name IN('Sweden','Norway','Denmark')

**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

1. Select name

**Find the country that start with Y**

SELECT name FROM world

WHERE name LIKE 'Y%'

**Find the countries that end with y**

SELECT name FROM world

WHERE name LIKE '%y'

**Find the countries that contain the letter x**

SELECT name FROM world

WHERE name LIKE '%x%'

**Find the countries that end with land**

SELECT name FROM world

WHERE name LIKE '%land'

**Find the country that has oo in the name**

SELECT name FROM world

WHERE name LIKE '%oo%'

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

SELECT name FROM world

WHERE name LIKE '%a%a%a%'

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

SELECT name FROM world

WHERE name LIKE '\_t%'

ORDER BY name

**Find the countries that have exactly four characters.**

SELECT name FROM world

WHERE name LIKE '\_\_\_\_'

**Find the country where the name is the capital city.**

SELECT name

FROM world

WHERE name LIKE capital

**Find the country where the capital is the country plus "City".**

SELECT name

FROM world

WHERE capital LIKE concat(name,' City')

**Find the capital and the name where the capital includes the name of the country.**

SELECT capital,name

FROM world

WHERE capital LIKE concat('%',name,'%')

**Find the capital and the name where the capital is an extension of name of the country.**

SELECT capital,name

FROM world

WHERE capital LIKE concat(name,'\_%\_')

**Show the name and the extension where the capital is an extension of name of the country.**

SELECT name,(replace(capital,name,''))

FROM world

WHERE capital LIKE concat(name,'\_%\_')

**2. Select From World Tutorial**

**Show the name, continent and population of all countries.**

SELECT name, continent, population FROM world

**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

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

SELECT name,GDP/population FROM world

WHERE population>=200000000

**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 FROM world

WHERE continent='South America'

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

SELECT name,population FROM world

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

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

SELECT name FROM world

WHERE name LIKE '%United%'

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

SELECT name,population,área FROM world

WHERE population>250000000 or area>3000000

**Show the countries that are big by area or big by population but not both. Show name, population and area.**

SELECT name,population,area FROM world

WHERE population>250000000 xor area>3000000

**For South America show population in millions and GDP in billions both to 2 decimal places.**

SELECT name, ROUND(population/1000000,2), ROUND(GDP/1000000000,2) FROM world

WHERE continent='South America'

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

SELECT name,round(GDP/population,-3) FROM world

WHERE GDP>1000000000000

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

SELECT name,capital FROM world

WHERE LENGTH(name) LIKE LENGTH(capital)

**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.**

SELECT name, capital FROM world

WHERE LEFT(name,1) LIKE LEFT(capital,1) AND name <> capital

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

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 '% %'

**3. Nobel Laureates**

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

SELECT yr, subject, winner FROM nobel

WHERE yr = 1950

**Show who won the 1962 prize for Literature.**

SELECT winner FROM nobel

WHERE yr = 1962 AND subject = 'Literature'

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

SELECT yr,subject FROM nobel

WHERE winner='Albert Einstein'

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

SELECT winner FROM nobel

WHERE yr>=2000 AND subject='Peace'

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

SELECT \* FROM nobel

WHERE yr>1979 and yr<1990 and subject='Literature'

**Show all details of the presidential winners:**

**● Theodore Roosevelt**

**● Woodrow Wilson**

**● Jimmy Carter**

**● Barack Obama**

SELECT \* FROM nobel

WHERE winner IN ('Theodore Roosevelt', 'Woodrow Wilson', 'Jimmy Carter', 'Barack Obama')

**Show the winners with first name John**

SELECT winner FROM nobel

WHERE winner LIKE 'John%'

**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)

**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<>'Chemistry' AND subject<>'Medicine'

**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='Literature' and yr>=2004) OR (subject='Medicine' and yr<1910)

**Find all details of the prize won by PETER GRÜNBERG**

SELECT \* FROM nobel

WHERE winner='PETER GRÜNBERG'

**Find all details of the prize won by EUGENE O'NEILL**

SELECT \* FROM nobel

WHERE winner='EUGENE O''NEILL'

**List the winners, year and subject where the winner starts with Sir. Show the the most recent first, then by name order.**

SELECT winner,yr,subject FROM nobel

WHERE winner LIKE 'Sir%'

ORDER BY yr desc

**Show the 1984 winners and subject ordered by subject and winner name; but list Chemistry and Physics last.**

SELECT winner, subject FROM nobel

WHERE yr=1984

ORDER BY subject IN ('Chemistry','Physics'), subject, winner

**4. SELECT within SELECT**

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

SELECT name FROM world

WHERE population >

(SELECT population FROM world

WHERE name='Russia')

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

SELECT name FROM world

WHERE continent='Europe' AND gdp/population>

(SELECT gdp/population FROM world

WHERE name='United Kingdom')

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

SELECT name, continente FROM world

WHERE continent='South America' OR continent='Oceania'

ORDER BY name asc

**Which country has a population that is more than Canada but less than Poland? Show the name and the population.**

SELECT name,population FROM world

WHERE population > (SELECT population FROM world WHERE name='Canada')

AND population<(SELECT population FROM world WHERE name='poland')

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

SELECT name,CONCAT(ROUND(100\*population/(SELECT population FROM world WHERE name='GERMANY')),'%') FROM world

WHERE continent='EUROPE'

**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>0 )

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

SELECT continent, name,area FROM world x

WHERE area >= ALL (SELECT area FROM world y

WHERE y.continent=x.continent AND area>0)

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

SELECT continent, name FROM world x

WHERE name <= ALL

(SELECT name FROM world y

WHERE y.continent=x.continent)

Problemas que en los que no logramos escribir alguna sentencia

9 y 10

**5. SUM AND COUNT**

**Show the total population of the world**

SELECT SUM(population) FROM world

**List all the continents - just once each**

SELECT DISTINCT continente FROM world

**Give the total GDP of Africa**

SELECT SUM(GDP) FROM world

WHERE continent='Africa'

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

SELECT COUNT(name) FROM world

WHERE area>1000000

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

SELECT SUM(population) FROM world

WHERE name IN ('Estonia', 'Latvia', 'Lithuania')

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

SELECT continent,COUNT(name) FROM world

GROUP BY continent

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

SELECT continent,COUNT(name) FROM world

WHERE population>10000000

GROUP BY continent

**List the continents that have a total population of at least 100 million.**

SELECT continente FROM world

GROUP BY continent

HAVING SUM(population)>100000000

**D.**

**8 consultas: una para cada uno de los tipos de operadores.**

**Lógicos: Lista de los países que no están en Asia**

SELECT name FROM world

WHERE NOT continent = 'Asia'

**De comparación: Paises con un area entre 1000 y 10000**

SELECT name FROM world

WHERE area BETWEEN 1000 AND 10000

**Numéricos: Los paises cuya area sea impar**

SELECT name FROM world

WHERE area MOD 2 = 1

**Cadenas:** **Nombres con mas de 15 caracteres**

SELECT name FROM world

WHERE LENGTH(name) > 15

**Agrupamiento: Area de total Asia**

SELECT SUM(area) FROM world

WHERE continent = 'Asia'

**Cambio de tipo: Area de los paises en decimal**

SELECT CAST(area AS DECIMAL) FROM world

No se pudo realizar consulta para: Condicionales, Tiempo

**3 consultas anidadas que usen otra consulta:**

**País más poblado en el mundo**

SELECT name FROM world

WHERE population >=ALL(SELECT population FROM world

WHERE population>0)

**Países mas grandes que el país más grande de América**

SELECT name FROM world

WHERE area >= ALL(SELECT area FROM world

WHERE continent = 'America')

**Países mas grandes que oceania**

SELECT \* FROM world

WHERE area>=(SELECT SUM(area) FROM world

WHERE continent = 'Oceania')