library codelab / SQL for Beginners

What is SQL? SQL stands for **Structured Query Language**. This language allows you to query databases, create databases, and add new information to them. It can work with coding languages, such as Python, PHP, and others.

Is SQL the only way to interact with a database? Of course not! SQL is perhaps the oldest, becoming a standard in the mid-1980s, but there are many ways to interact with databases. Learning SQL is important because it is still the standard for most databases, and if you end up using something else, the concepts are important to learn. SQL's ability to talk with programming languages, such as Python, make it still a versatile and robust choice.

What does SQL look like?

SQL uses several standard commands to access and manipulate databases. Once you've mastered a few of these, you can easily talk to a database, or even create one.

```
CREATE TABLE users (
        User_id INT(6),
        Last_name VARCHAR(30),
        First_Name VARCHAR(30),
        Email VARCHAR(45)
);

INSERT INTO users ('123456','Smith','Sally','ssmith@email.com');

SELECT * FROM users;
```

User_id	Last_name	First_name	Email
123456	Smith	Sally	ssmith@email.com

To learn more, visit: **www.w3schools.com/sql**

SQL COMMANDS

Command	What it Does	Syntax	Example
CREATE DATABASE	Creates a new database	CREATE DATABASE *databasename*;	CREATE DATABASE mydatabase;
CREATE TABLE	Creates a new table within your database	CREATE TABLE *tablename* (*column1 datatype,* *column2 datatype,* *column3 datatype*);	CREATE TABLE users (userID INT(10), lastName VARCHAR(35), firstName VARCHAR(45));
INSERT INTO	Add data to your table	INSERT INTO *tablename* VALUES (*value1, value2, value3*);	INSERT INTO users VALUES ('1234567891', 'Smith','Sally');
SELECT	Query your data and return a result	SELECT *column1* FROM *tablename*;	SELECT lastName FROM users;
SELECT ALL	Select all results from a table	SELECT * FROM *tablename*;	SELECT * FROM users;
WHERE	Give your select query a condition	SELECT *column1* FROM *table_name* WHERE *condition*;	SELECT * FROM users WHERE Country='Mexico';
DROP TABLE	Delete Table from DB	DROP TABLE *tablename*;	DROP TABLE users;
JOIN	Link two tables using a common field	SELECT * FROM *table1, table 2* WHERE *id=personid*;	SELECT * FROM users, locations WHERE ID=userID;

SQL DATATYPES

Datatype	Definition	Example
INT(size)	An integer with length specified in parenthesis.	UserID INT(7)
VARCHAR(size)	Variable length string containing letters, numbers, special characters.	firstName VARCHAR(45)
CHAR(size)	Fixed length string containing letters, numbers, special characters.	LastName CHAR(14)
DATE	Creates a date in format of YYYY-MM-DD	Start_Date DATE

Project: Library Database

In this exercise, we will download an existing database that includes a list of library books and library users.

1. Download the Library.db from the Codelab Github (github.com/library codelab).
2. Go to **sqlliteonline.com** and select **File > Open DB** and choose the Library.db file.
3. First, use your SELECT command to see what is in the database.

   SELECT * **FROM** Books;

4. Use the **WHERE** command to filter based on a condition:

   SELECT * **FROM** Books **WHERE** Collection="gna";

4. Add a new user to your Users database (leave Book field blank).
5. Add two new books.
6. "Check out" one of the new books to one of your users.
7. Pull a list to show what books are checked out to which users.

   *Can you edit this list to only show the book title and user first * last name?

8. Create a new table that lists 3 library locations and shows which books are at those locations.
9. Pull a list of which books are at which locations.

BONUS

Create your own database. You might want to sketch out what tables and fields you want. You can delete the library tables using **DROP TABLE** or you can just add some new tables in the existing Database.