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4. MODULE PLAN AND CONTENT

ALGORITHM - SQL

Version 1.0

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1. MODULE PLAN

Module Plan	
Module Title	**SQL Fundamentals**
Duration	1.5 hours
Learning Objectives	By the end of this module, participants will be able to: • Explain what SQL is and where it is used (apps, websites, businesses, education). • Identify the core SQL commands: SELECT, INSERT, UPDATE, DELETE and when to use each. • Write and run simple SQL statements to retrieve, add, update, and delete data. • Read and reason about table structures (tables, rows/records, columns/fields). • Apply basic filtering with WHERE and simple sorting with ORDER BY.
Lesson Plan	**SQL and Databases** **Training Module for Deaf Youth** **Duration:** ~90 minutes (intro + 2 hands-on blocks + wrap-up) **0. Welcome & Setup (Intro) — 10 minutes** **Objective: Ground learners in what SQL and databases are.** Introduce SQL and explain where and how it is used **Main Points to Cover:** What SQL is used for; tables, rows, columns; the big four commands.

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Module Plan	
	Activity: 2-minute "Command Match" warm-up (SELECT / INSERT / UPDATE / DELETE). **Teaching Methodology:** • **Interactive presentation with visual schema examples (tables • rows • columns) and iconography.** • **Small-group discussion (think-pair-share) to surface prior knowledge.** • Short fill-in worksheet: match real-world task → SQL command (SELECT / INSERT / UPDATE / DELETE).
	1. Getting Data with SELECT — 35 minutes **Objective:** Retrieve and read data using SELECT, filter with WHERE, sort with ORDER BY, and optionally limit results. **Main Points to Cover:** 2. SELECT <columns> FROM <table> 3. choosing columns vs * 4. WHERE with basic comparisons 5. AND/OR 6. ORDER BY ASC/DESC **Demo Examples (Library dataset):**

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```
7. SELECT * FROM Books WHERE Category = 'Fiction';

8. SELECT Name, Email FROM Customers WHERE City = 'Vienna' ORDER
   BY Name;
```

Activity – "Query Detective (Lite)"

9. Learners translate 4–5 natural-language prompts into queries, escalating from simple filters to combining WHERE + ORDER BY.
10. Instructor circulates, then quick group share of 1 tricky prompt.

Teaching Methodology:

- **Online SQL editor:** Programiz SQL Online Compiler (shared starter link with Setup Script pre-pasted).
- **Code-along:** Instructor types queries live; learners run them and read outputs.
- **Group support:** Pairs compare outputs and help debug mismatches.
- **Minimal typing, maximum logic:** Emphasis on choosing columns, crafting filters, and reading result tables.

2. Changing Data Safely — 35 minutes

Objective:

Modify data with INSERT, UPDATE, DELETE using a safe, preview-first habit.

Main Points to Cover:

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11. INSERT INTO <table> (<columns>) VALUES (...);
12. UPDATE <table> SET <column>=<value> WHERE <condition>; (stress importance of WHERE).
13. DELETE FROM <table> WHERE <condition>; (never delete without WHERE in practice).
14. The safe cycle: Preview with SELECT → Change → Verify with SELECT.

Demo Examples:

15. `INSERT INTO Customers (Name, Email, City) VALUES ('John Doe','john@example.com','New York');`
16. `UPDATE Books SET Price = 9.99 WHERE Title = 'SQL Basics';`
17. `DELETE FROM Books WHERE Year < 2000;`

Activity – "Safe Edit Relay (Mini)"

- Pairs perform one add, one update, one delete on preselected rows, verifying each change with `SELECT` before/after.

Teaching Methodology:

- **Programiz SQL** with the same dataset; instructor demonstrates **Preview → Change → Verify** visibly (color-coded steps on slides/board).
- **Guided practice:** Learners perform one INSERT, one UPDATE, one DELETE with immediate result checks.
- **Risk awareness:** Discuss real-world safeguards (transactions, backups) in simple terms.
- **Group reflection:** 2–3 volunteers explain how their WHERE condition protected data.

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Module Plan	
Materials Needed	▪ Internet-connected desktop, laptops or tablets ▪ Access to: o Online SQL Editor (e.g. https://www.programiz.com/sql/online-compiler)

2. MODULE CONTENT

Content	Description	Content
Lesson Content	**Key Digital Terms:**	**Key Digital Terms:** ● SQL (Structured Query Language): A language used to communicate with databases. ● Database: An organized store of information (like a digital filing cabinet). ● Table: A collection of related data arranged in rows and columns. ● Row / Record: One entry in a table (e.g., one book, one customer). ● Column / Field: A named property of each row (e.g., Title, Price, City). ● SELECT: Get/read data from a table.

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Content	Description	Content
		• INSERT: Add new data to a table. • UPDATE: Change existing data in a table. • DELETE: Remove data from a table. • WHERE: Filter rows that match a condition. • ORDER BY: Sort results by a column.
Video summary	**Youtube Links**	• **Abstraction:** https://youtube.com/shorts/vsVQqE5P9Bs?feature=share • **Algorithm** – https://youtube.com/shorts/Ld_iFKCxeS8 • **Computational Thinking** – https://youtube.com/shorts/0iIlANTeKsc?feature=share • **Big Data -** https://youtube.com/shorts/A9DS0qNId08?feature=share • **Cloud Storage -** https://youtube.com/shorts/GPVztgeYrQg?feature=share • **SQL -** https://youtube.com/shorts/aEjeuZvDZ6Q?feature=share •
Activity		Real-Life Scenarios (SQL Discussion — No Coding) **Goal:** Apply database thinking, query planning, and safe-edit habits to real-life inspired mini-projects **without writing code**. **How it works** • Participants work individually or in pairs with scenario cards. • For each scenario, they draft a **step-by-step plan (algorithm)** that names the tables, columns, and conditions they would use, and where they would preview, change, and verify. • Use visual aids only (schema cards, sticky notes, whiteboard). **No SQL typing.**

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		Scenario prompts (pick 2–3) • **Personalized Greeting Data:** A site wants to show a friendly greeting when a member logs in. *What data would you store (e.g., first name, last login time)? Which table/columns would your plan read to compose the greeting? What should be visible vs private?* • **Bookstore Counter Lookup:** A clerk must quickly find a customer's **name, email, and city** when given part of their name. *Which table/columns would you search? What matching rules (exact vs contains) feel safest? How would you sort multiple matches?* • **New Arrivals Widget:** The homepage shows the **5 most recent books**. *Which column defines "recent"? How would you plan the steps to preview the 5 newest rows before publishing?* • **Seasonal Discount Update:** Marketing applies a 10% discount to **Fiction** books for one week. *How would you safely plan this change? What preview would you run first? How would you verify and later restore prices?* • **Clean Up Old Records:** Policy says to remove books **older than 2005** from public listings. *What is your exact condition? How would you protect against deleting the wrong rows? Would you archive instead of delete?* **Each scenario requires** • A plan written as an **algorithm** (logical steps), including: data needed (tables/columns), filter conditions, sort rules, and the safe cycle **Preview → Change → Verify** (when applicable). • Use of non-coding tools only (paper, whiteboard, slide with schema).

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		• A short **reflection**, answering:
		  ○ *What helped you design the plan (diagram, schema, examples)?*
		  ○ *Which part felt most natural (choosing columns, deciding filters, verifying results)?*
		  ○ *What was difficult or unexpected (ambiguous criteria, risky deletes, duplicate IDs)?*

Assessment	**Quiz**	☐ Which SQL command retrieves data from a table? A. `INSERT` B. `UPDATE` C. `SELECT` ☑ D. `DELETE` ☐ Which part of a query filters rows that meet a condition? A. `ORDER BY` B. `WHERE` ☑ C. `VALUES` D. `FROM` ☐ What is the safest habit before running `UPDATE` or `DELETE`? A. Remove the `WHERE` clause B. Run a preview `SELECT` ☑

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		C. Sort by name D. Use * in SELECT □ Which statement adds a new row? A. UPDATE B. INSERT ☑ C. SELECT D. DELETE □ What does ORDER BY do? A. Filters rows B. Sorts results ☑ C. Adds a row D. Deletes rows

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