# Introduction to SQL

**FinTech**

**Lesson 7.1**

# Learning Outcomes

By the end of this unit, you will be able to:

**01**

Create a data model to represent the objects and relationships in a dataset.

**02**

Create schemas, tables, and databases for relational data.

**03**

Retrieve data using advanced database queries.

# Class Objectives

By the end of today's class, you will:

Install PostgreSQL and pgAdmin on your computer.

Create databases and tables using pgAdmin.

Define SQL data types, primary keys, and unique values.

Load CSV files into a database.

Query data from a database.

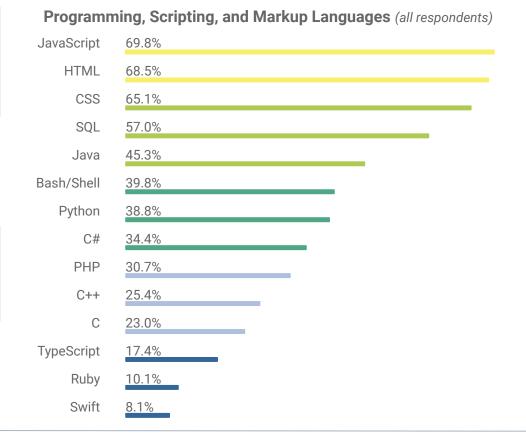Articulate the four basic functions of CRUD and apply them to a database.

Combine data from multiple tables using JOINs.

# Why SQL?

**S**tructured **Q**uery **L**anguage (SQL) is one of the main query languages used to access data within relational databases.

**SQL** is designed to efficiently handle large amounts of data, resulting in high value to organizations.

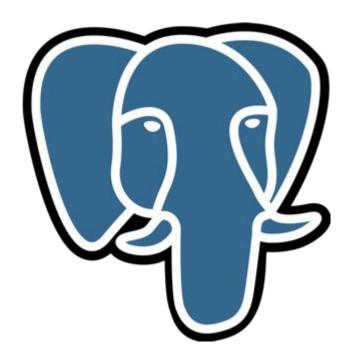Experienced **SQL** programmers are in high demand.

**Programming, Scripting, and Markup Languages** *(all respondents)*

| Language | Percent |
|---|---|
| JavaScript | 69.8% |
| HTML | 68.5% |
| CSS | 65.1% |
| SQL | 57.0% |
| Java | 45.3% |
| Bash/Shell | 39.8% |
| Python | 38.8% |
| C# | 34.4% |
| PHP | 30.7% |
| C++ | 25.4% |
| C | 23.0% |
| TypeScript | 17.4% |
| Ruby | 10.1% |
| Swift | 8.1% |

# Postgres and pgAdmin

# Postgres

PostgreSQL (usually referred to as "Postgres") is an object-relational database system that uses the SQL language.

- Database engine
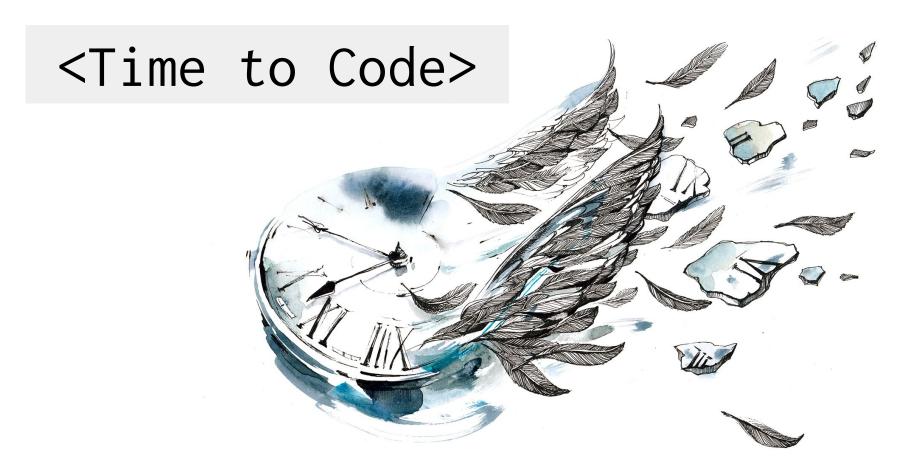
- Open source

- Great functionality

# pgAdmin

**pgAdmin** is the management tool used for working with Postgres.
It simplifies creation, maintenance, and use of database objects.

<Time to Code>

# Take a Break!

# CRUD

# CRUD Operations

**Create Read Update Delete** is a set of operations used with persistent storage.

| | |
|---|---|
| **Create** | INSERT INTO table (column1, column2, column3) |
| **Read** | SELECT * FROM table |
| **Update** | UPDATE table SET column1 = VALUE WHERE id = 1 |
| **Delete** | DELETE FROM table WHERE id = 5 |

These tools are fundamental to all programming languages, not just SQL.

# Wildcards

# Wildcards: % and _

Wildcards are used to substitute zero, one, or multiple characters in a string. The keyword **LIKE** indicates the use of a wildcard.

```
SELECT *

FROM actor

WHERE last_name LIKE 'Will%';
```

```
SELECT *

FROM actor

WHERE first_name LIKE '_AN';
```

The **%** will substitute **zero**, **one**, or **multiple** characters in a query.

For example, all of the following will match: **Will**, **Willa**, and **Willows**.

The _ will substitute one, and only one, character in a query.

**_AN** returns all actors whose first name contains three letters, the second and third of which are **AN**.

# &lt;Time to Code&gt;