Phase 1: Python Logic & Fundamentals (Days 1–15)

Goal: Master the "brain" of your programs.

- **Days 1–3: The Basics**
  - Setup (VS Code, Python 3.12+).
  - Variables, Data Types (`int`, `float`, `str`, `bool`).
  - Basic Input/Output and Type Casting.
- **Days 4–7: Control Flow**
  - Comparison and Logical Operators.
  - `if`, `elif`, `else` statements.
  - Loops: `for` (iterating sequences) and `while` (condition-based).
  - **Practice:** Build a "Guess the Number" game.
- **Days 8–11: Data Structures**
  - Lists (Slicing, appending, sorting).
  - Dictionaries (Key-Value pairs, JSON-like structures).
  - Tuples and Sets (Immutability and unique values).
- **Days 12–15: Functions & Modules**
  - Defining functions, parameters, and `return`.
  - Scope (Local vs. Global).
  - Importing math, random, and datetime modules.

Phase 2: Database Mastery with SQL (Days 16–25)

Goal: Master data storage and retrieval.

- **Days 16–18: SQL Basics**
  - Introduction to Relational Databases.
  - `CREATE TABLE`, `DROP TABLE`, `ALTER TABLE`.
  - CRUD Operations: `INSERT`, `SELECT`, `UPDATE`, `DELETE`.
- **Days 19–22: Advanced Querying**
  - Filtering with `WHERE`, `LIKE`, `IN`, and `BETWEEN`.
  - Ordering and Limiting results.
  - Aggregations: `COUNT`, `SUM`, `AVG`, `GROUP BY`, `HAVING`.
- **Days 23–25: Joins & Relationships**

- Primary Keys vs. Foreign Keys.
- `INNER JOIN`, `LEFT JOIN`, and `CROSS JOIN`.
- **Practice:** Design a schema for a "Small Shop" (Customers, Orders, Products).

Phase 3: Object-Oriented Programming (Days 26–33)

Goal: Write professional, scalable code.

- **Days 26–28: OOP Foundations**
- Classes and Objects.
- The `__init__` constructor and `self`.
- Instance vs. Class attributes.

- **Days 29–31: Inheritance & Polymorphism**
- Parent vs. Child classes.
- Method Overriding.
- Encapsulation (Private variables `__var`).
- **Days 32–33: Exception Handling**
- `try`, `except`, `finally`.
- Handling Database Connection Errors.

Phase 4: Python + SQL Integration (Days 34–42)

Goal: Make Python talk to your Database.

- **Days 34–36: The Database Connector**
- Using `sqlite3` (built-in) or `psycopg2`/`mysql-connector`.
- Opening connections and using Cursors.

- **Days 37–39: Integrated CRUD App**
- Building a Python interface to add, delete, and view SQL data.
- Preventing **SQL Injection** using parameterized queries.

- **Days 40–42: Data Handling with Files**
- Importing CSV/JSON files into SQL tables using Python.
- Exporting SQL query results to Excel/CSV.

Phase 5: Capstone Project & Portfolio (Days 43–50)

Goal: Build a production-ready application.

The Project: "The Smart Finance Manager"

- **Features:**
  - User Login System (Python Logic).
  - Expense Tracking (SQL Database).
  - Category-wise Reports (SQL Aggregations).
  - Data Export to CSV (Python File Handling).

Timeline:

- **Day 43-44:** Schema Design and Logic Flowchart.
- **Day 45-48:** Coding the Core Engine.
- **Day 49:** Debugging and PEP 8 Code Cleaning.
- **Day 50:** Uploading to GitHub and Documentation.

Tools Checklist

Category	Tool
Language	Python 3.x
Database	SQLite (for learning) or MySQL
IDE	VS Code (Recommended)
Libraries	`sqlite3`, `pandas` (basic), `os`, `csv`