

Python Programming

Unit 04 – Lecture 04: Tkinter + Databases (Concepts and Integration)

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Repository: <https://github.com/tali7c/Python-Programming>

Quick Links

Core Concepts

Demo

Interactive

Summary

Agenda

1 Core Concepts

2 Demo

3 Interactive

4 Summary

Learning Outcomes

- Explain why apps use databases instead of plain files

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- Compare relational (SQL) and NoSQL databases

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- Explain why apps use databases instead of plain files
- Compare relational (SQL) and NoSQL databases
- Describe a basic GUI-to-database workflow
- Build a small Tkinter app that stores records in SQLite

Why Databases?

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- Fast search and structured storage
- Constraints (unique IDs), integrity, transactions
- Multi-user / multi-program access (in bigger systems)

Relational vs NoSQL (Quick Comparison)

Relational (SQL)	NoSQL
Tables (rows/columns)	Documents / key-value / graphs
Fixed schema	Flexible schema
SQL queries	Query APIs (varies)
Example: SQLite, MySQL	Example: MongoDB

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- Python has built-in `sqlite3` module

GUI → Database Flow

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- User enters values in GUI
- App validates input
- App runs SQL query (INSERT/SELECT/UPDATE/DELETE)
- App shows updated view (Listbox/Table)

Demo: Tkinter + SQLite Student Records

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 - create table if not exists
 - add a student record
 - display all records

Checkpoint 1

Question: Give one advantage of databases over plain text files.

Checkpoint 2

Question: In a relational database, what is a **primary key** and why is it useful?

Think-Pair-Share

Discuss:

- For a “Todo App”, would you use a file or a database? Why?

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- Relational DBs use tables and SQL; NoSQL offers flexible models
- SQLite is a practical starting point using Python's `sqlite3`
- GUI apps typically follow input → validate → query → refresh view

Exit Question

Write one SQL command to create a table `students(id, name)` where `id` is a primary key.