Week 1 - Lesson 3 Summary

Files, JSON, and Exceptions (CLI Save/Load)

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Lesson goal

Make your CLI app keep data after closing by saving to a JSON file and loading it back safely (without crashing).

What you learned

- JSON is just text that represents data (lists/dicts).
- Python's built-in **json** module converts Python data <-> JSON.
- File modes: **"w"** (write/overwrite), **"r"** (read).
- Use **with open(...) as f** so the file closes automatically.
- Handle errors with **try/except** to avoid crashes (missing file / broken JSON).

Core idea

Save = **json.dump** (Python -> JSON file). Load = **json.load** (JSON file -> Python).

Minimal save/load example

```
import json

items = ["banana", "toy car"]

# SAVE
with open("data.json", "w", encoding="utf-8") as f:
    json.dump(items, f, ensure_ascii=False, indent=2)

# LOAD
with open("data.json", "r", encoding="utf-8") as f:
    items = json.load(f)

print(items)  # ['banana', 'toy car']
```

Why try/except?

Loading can fail if the file does not exist yet, or if the JSON is corrupted. Instead of crashing, we catch the error and start with an empty list.

Safe load function

```
import json

DATA_FILE = "data.json"
```

```
def load_items():
    try:
        with open(DATA_FILE, "r", encoding="utf-8") as f:
            return json.load(f)
    except FileNotFoundError:
        print("No data.json yet. Starting empty.")
        return []
    except json.JSONDecodeError:
        print("data.json is broken. Starting empty.")
        return []
```

Save function

```
import json

DATA_FILE = "data.json"

def save_items(items):
    with open(DATA_FILE, "w", encoding="utf-8") as f:
        json.dump(items, f, ensure_ascii=False, indent=2)
```

Common options explained

Option	Meaning
"w"	Write mode: create/overwrite file
"r"	Read mode: read existing file
encoding="utf-8"	Support Arabic/emoji/special characters reliably
ensure_ascii=False	Keep real characters (don't convert to \uXXXX codes)
indent=2	Pretty formatting (easier to read file)

CLI integration checklist

✓ Add menu options: Load (4) and Save (5).

✓ Call **items = load_items()** when starting (optional) and/or when user chooses Load.

✓ Call **save_items(items)** when user chooses Save.

✓ Test: add -> save -> exit -> run again -> list (items should remain).

Quick rule to remember

List comprehension pattern:

```
[OUTPUT for ITEM in LIST if CONDITION]
```

Mini practice

- Add an "Auto-save on exit" feature (save right before exiting).

- Add a "Clear all items" option (empties list, then save).
- Try intentionally breaking data.json (delete a bracket) and confirm your program does not crash.