DIGITAL LPA & ISO COMPLIANCE MONITORING SYSTEM

A constraint-based LPA scheduler that enforces shift compatibility, balances audit workload, prevents repetitive pairings, and automatically adapts to staffing changes. Each auditor is assigned exactly two LPAs per month, and every assignment is validated against ISO audit rules.

Core Feature:

Python → scheduling logic, constraints, automation.

Excel → data input/output (for realism).

Power BI → visualization & management reporting.

(Optional later) Email alerts / lightweight GUI.

System Overview:

Tab	Function
Tab 1	Setup
Tab 2	Smart LPA Scheduler (constraint-aware, adaptive)
Tab 3	Month-by-Month LPA Completion Tracker
Tab 4	ISO & Corrective Action Aging & Overdue Flags

Tab 1: Setup

- User Inputs:
    - Add / remove employees
    - Assign role & shift
    - Add / remove plant sections
    - Mark employees active/inactive

Tab 2: SMART & ADAPTIVE LPA SCHEDULER

- Functional Requirements:
    - Inputs
    - Personnel
    - First name
    - Last name
    - Role (Engineer / Supervisor / Manager)

- Shift (1st / 2nd / 3rd)
- Plant Sections
- Dynamically add/remove (311, 341, 361, etc.)
- Month to schedule
- Scheduling Rules (Constraints)
  - LPA performed in pairs of 2 (3 only if needed)
  - Shift compatibility enforced
  - Avoid repeating the same pair within 4 months
  - Engineers / supervisors / managers allowed
  - Automatically adapts to hires / removals
- Shift Compatibility Logic

Target Shift	Allowed Auditors	Forbidden Pairs
1st	1st + 2nd or 1st + 3rd or 1st + 1st	2nd + 3rd
2nd	2nd + 1st or 2nd + 3rd or 2nd + 2nd	1st + 3rd
3rd	3rd + 1st or 3rd + 2nd or 3rd + 3rd	1st + 2nd

- User-Driven Inputs
  - **A. Plant Sections**
    - Add / remove sections dynamically
    - Example: 311 – Coil Winding, 341 – Internal Assembly, etc.
  - **B. Employees**
    - Each employee has:
    - First Name
    - Last Name
    - Role (Engineer / Supervisor / Manager)
    - Shift (1st / 2nd / 3rd)
    - Active / Inactive status (for hires & removals)
- Monthly LPA Requirements
  - Each employee must perform **exactly 2 LPAs per month**
  - LPAs are performed in **pairs of 2**
  - **3-person LPAs allowed only as a fallback** (edge case)
  - LPAs are assigned to:
    - A **plant section**
    - A **target shift** (1st, 2nd, or 3rd)

Tab 3 — LPA Completion Tracker

- Completed vs missed LPAs
- Completion rate by:
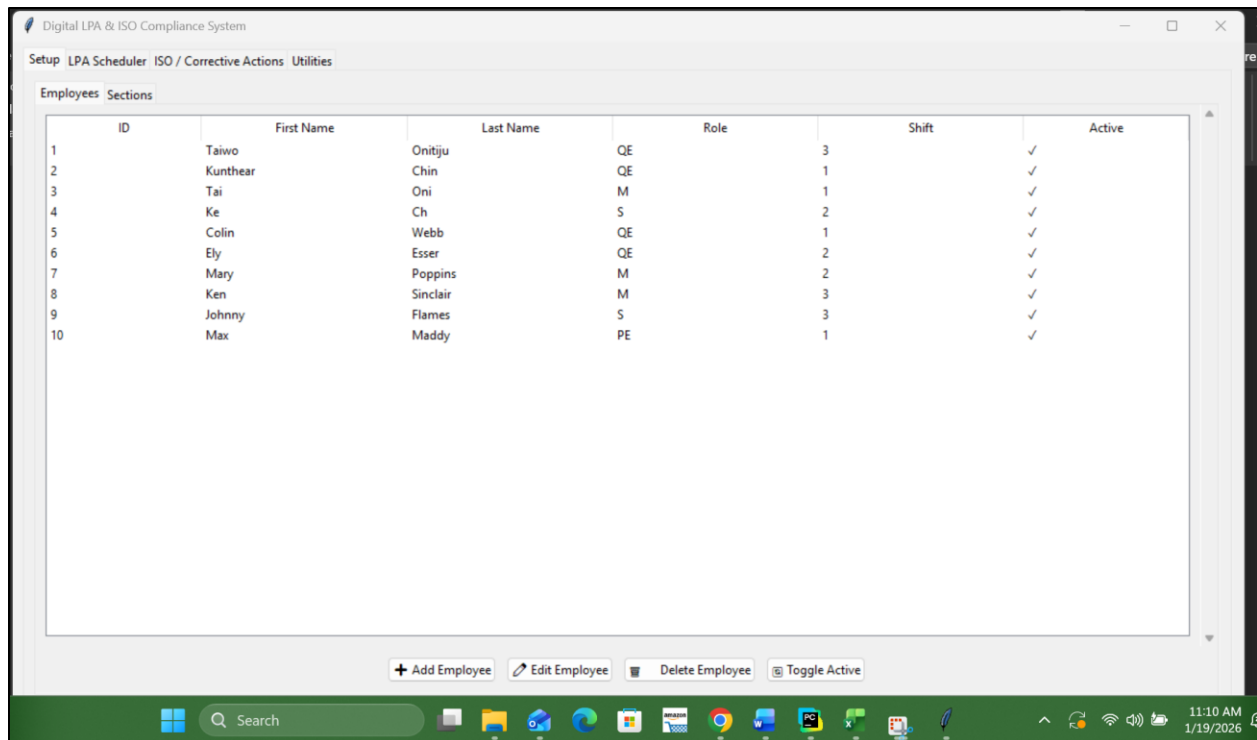
- o Section
- o Shift
- o Role
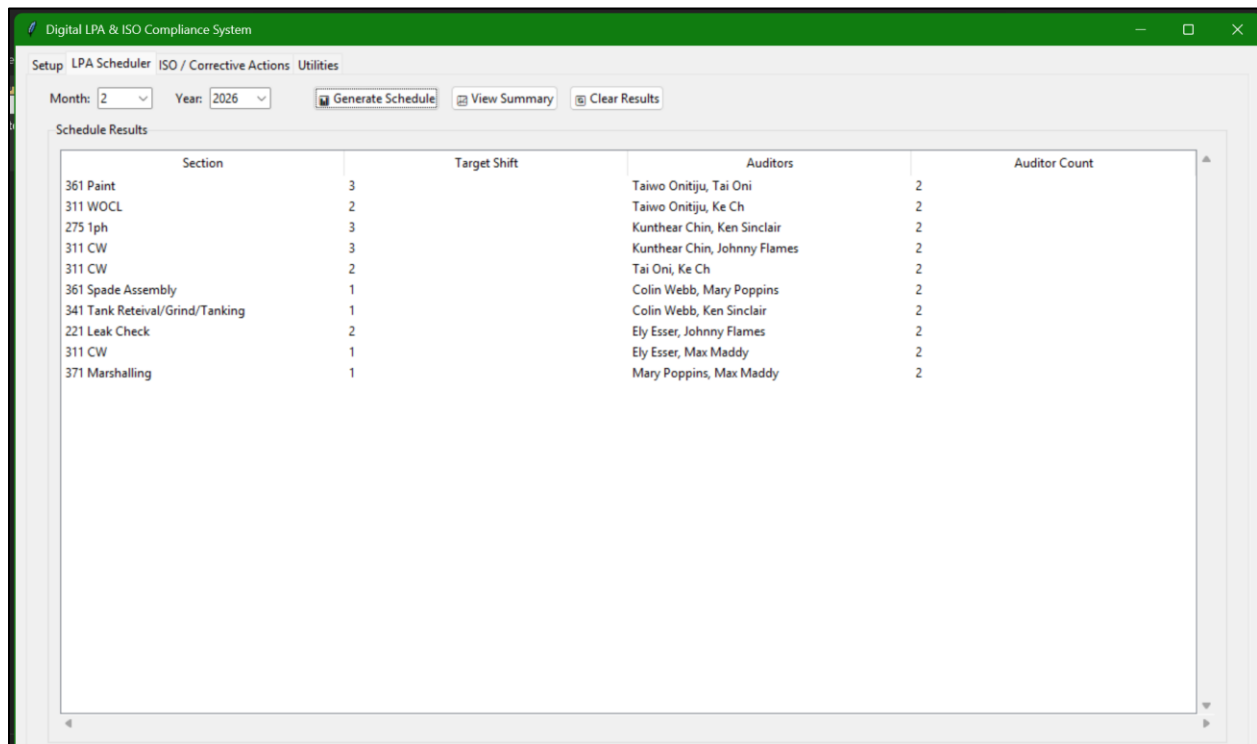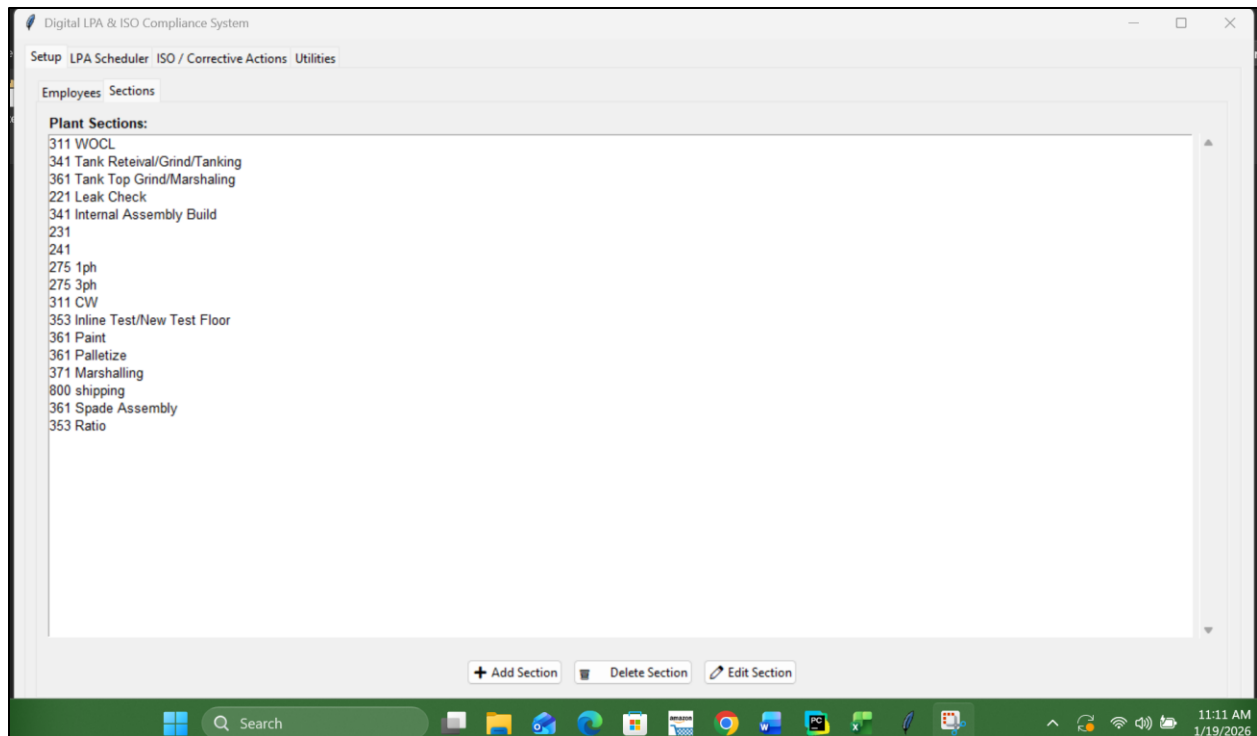
Tab 4 — ISO & Corrective Actions

- Nonconformities
- Due dates
- Automatic overdue flagging
- Aging analysis

System Architecture (Clean & Scalable):

- Python GUI (Tkinter or PyQt)
- Export results to Excel
- Power BI reads Excel outputs

TESTING FOR FUNCTIONALITY

Window 1: Setup / Sections

Digital LPA & ISO Compliance System

Setup | LPA Scheduler | ISO / Corrective Actions | Utilities

Employees | Sections

Plant Sections:

311 WOCL
341 Tank Reteival/Grind/Tanking
361 Tank Top Grind/Marshaling
221 Leak Check
341 Internal Assembly Build
231
241
275 1ph
275 3ph
311 CW
353 Inline Test/New Test Floor
361 Paint
361 Palletize
371 Marshalling
800 shipping
361 Spade Assembly
353 Ratio

[+ Add Section] [🗑 Delete Section] [✏ Edit Section]

11:11 AM
1/19/2026

Window 2: LPA Scheduler

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Setup | LPA Scheduler | ISO / Corrective Actions | Utilities

Month: 2   Year: 2026   [▣ Generate Schedule] [▤ View Summary] [▣ Clear Results]

Schedule Results

Section	Target Shift	Auditors	Auditor Count
361 Paint	3	Taiwo Onitiju, Tai Oni	2
311 WOCL	2	Taiwo Onitiju, Ke Ch	2
275 1ph	3	Kunthear Chin, Ken Sinclair	2
311 CW	3	Kunthear Chin, Johnny Flames	2
311 CW	2	Tai Oni, Ke Ch	2
361 Spade Assembly	1	Colin Webb, Mary Poppins	2
341 Tank Reteival/Grind/Tanking	1	Colin Webb, Ken Sinclair	2
221 Leak Check	2	Ely Esser, Johnny Flames	2
311 CW	1	Ely Esser, Max Maddy	2
371 Marshalling	1	Mary Poppins, Max Maddy	2

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Setup | LPA Scheduler | ISO / Corrective Actions | Utilities

Description	Owner	Due Date	Status
Oil Spill on Floor at machine 2	Supervisors at 341	01/20/2026	Open

+ Add Action **✏ Edit Action** **🗑 Delete Action** **☑ Mark Complete** **🔄 Refresh**

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Setup | LPA Scheduler | ISO / Corrective Actions | Utilities

🗐 View Log File

🗁 Open Output Folder

🗐 Backup All Data

🗑 Clear Log File