90-Day Self-Study Plan: Python for Industrial Automation (for Electricians)

Introduction

This 90-day plan is tailored for electricians who want to break into automation and Python programming, without the need for formal education. It assumes 3-5 hours per week and is structured around real-world skills you can build in your spare time.

Month 1: Python Fundamentals

Week 1: Learn basic Python syntax, variables, and data types.

Week 2: Control flow (if/else), logical operators, and simple conditions.

Week 3: Functions and file I/O (read/write sensor data).

Week 4: Lists, dictionaries, and simulate device states.

Goal: Simulate basic control behavior (e.g., start/stop logic).

Month 2: Control Systems and I/O

Week 5: Learn control systems and PLC logic via simulators like PLC Fiddle.

Week 6: GPIO with Raspberry Pi or simulation. Read button input, control an LED.

Week 7: Use timers and simulate interlocks in Python.

Week 8: Build a 3-wire motor control simulation project.

Goal: Python script simulating real-world control logic.

Month 3: Modbus and Final Project

Week 9: Learn Modbus protocol basics.

Week 10: Use pymodbus to poll from a simulator or dummy data.

Week 11: Visualize data with matplotlib or Streamlit.

Week 12: Complete and document a final project.

Goal: Complete a Mini-SCADA or Smart Panel project.

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Tools and Resources

- Python: https://www.python.org
- PLC Simulator: https://plcfiddle.com
- Modbus Simulator: ModbusPal
- Raspberry Pi Docs: https://www.raspberrypi.com/documentation
- Python Libraries: pymodbus, matplotlib, streamlit, gpiozero