# Python-based Test Automation for GIC HMI and PLC

UNDER THE GUIDANCE OF: Prof. U. V. Bomble

NAMES:

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# Project Plan for Python-based Test Automation for GIC HMI and PLC

## 1. Project Overview

Objective: Develop a Python-based test automation framework to facilitate automated testing for GIC HMI and PLC systems.  
Scope: The project will focus on automating the testing processes for HMI interfaces and PLC controllers using Python scripting, integrating with existing testing tools, and ensuring reliable execution across different environments.

## 2. Key Components

### A. Test Automation Framework Development

Task 1: Research Python libraries for HMI and PLC automation (e.g., pycomm3, modbus-tk).

Task 2: Design a modular framework that allows easy extension for future test cases.

Task 3: Implement test cases for key functionalities of GIC HMI and PLC systems.

### B. Integration and Testing

Task 1: Integrate the Python-based framework with GIC HMI and PLC systems for real-time testing.

Task 2: Develop scripts to simulate input/output for various test scenarios.

Task 3: Validate and verify test automation results against expected behaviors.

### C. Reporting and Documentation

Task 1: Set up automated reporting features for test results (e.g., generate logs, detailed test reports).

Task 2: Create detailed user documentation for utilizing the automation framework.

## 3. Agreed Deliverables for Project Closure

Deliverable 1: Automated Test Scripts  
Complete suite of Python scripts for testing key functionalities of GIC HMI and PLC.

Deliverable 2: Test Automation Framework Documentation  
User manuals and technical documentation detailing the framework’s structure, usage, and future extensions.

Deliverable 3: Test Reports  
Reports detailing test case results, performance metrics, and any discrepancies found.

Deliverable 4: Final Presentation  
Summary of the framework’s design, results from testing, and recommendations for further improvements.

## 4. Review Mechanism

### A. Regular Progress Meetings

Schedule weekly meetings to review automation progress, address challenges, and discuss upcoming tasks.

### B. Milestone Reviews

Conduct milestone reviews at key project phases (e.g., framework development, integration testing) to assess progress and ensure alignment with goals.

### C. Final Evaluation

Conduct a final evaluation upon project completion to review deliverables, gather insights, and provide recommendations for future projects.

## 5. Timeline

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| --- | --- | --- | --- |
| Phase | Duration | Start Date | End Date |
| Project Planning | 2 weeks | 16/10/2024 | 30/10/2024 |
| Framework Development | 6 weeks | 31/10/2024 | 12/12/2024 |
| Integration & Testing | 5 weeks | 13/12/2024 | 16/01/2025 |
| Reporting & Documentation | 3 weeks | 17/01/2025 | 06/02/2025 |

## 6. Resources Required

Tools: Python development tools, testing hardware for GIC HMI and PLC systems, version control, project management software.