

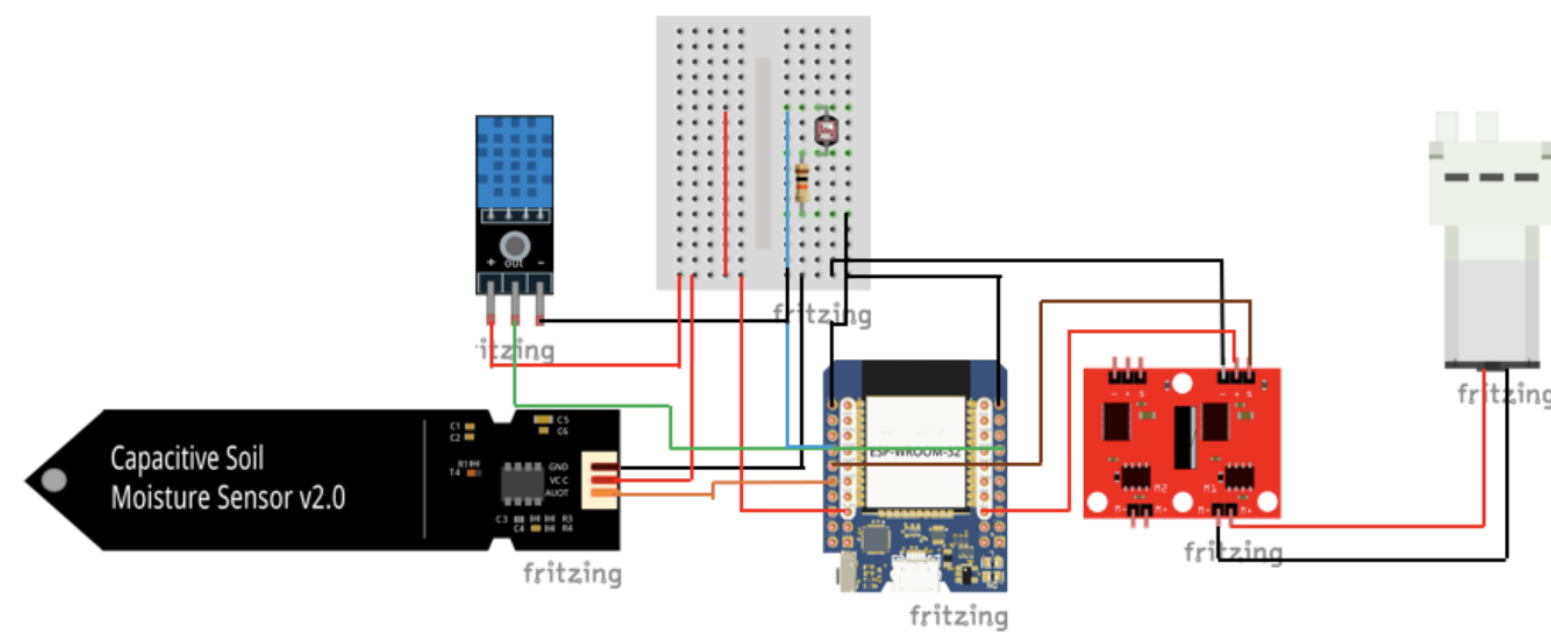


# ENGR 111 - J - GROUP 2 - Water Plant System

We pledge our honor that we have abided by the Stevens Honor System

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ENGR 111: Intro to Engineering Design – Fall 2025

Circuit Diagram

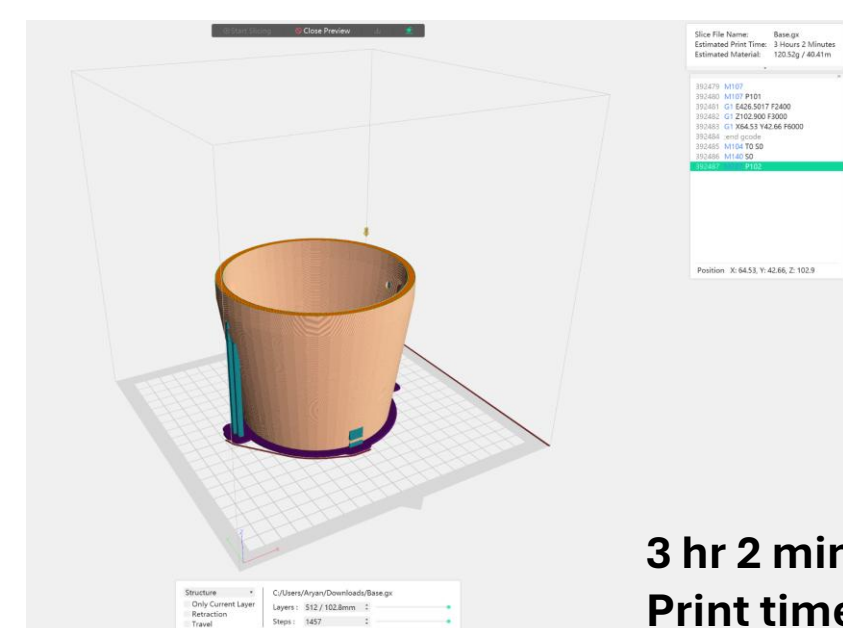
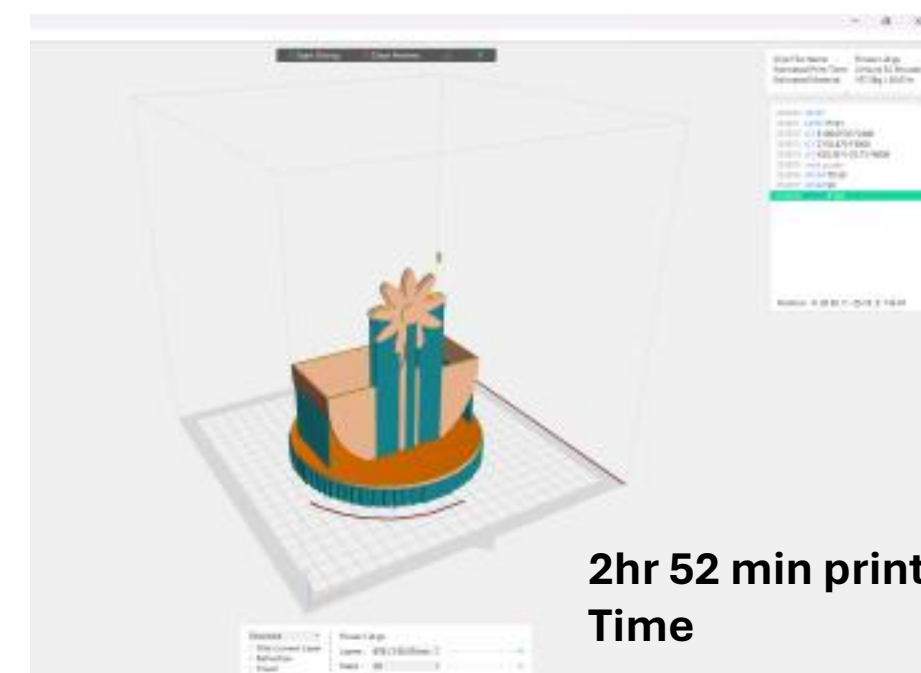


## PROBLEM STATEMENT

The purpose of this project is to develop an autonomous smart-watering system that monitors plant conditions and delivers water only when necessary. The main objectives are to measure soil moisture, temperature, humidity, and light, transmit the data through MQTT, and activate the pump when the moisture level falls below a set threshold. Our system is compact, reliable, and is able to operate continuously within the required size and design constraints.

Prototype for base pot in solid work

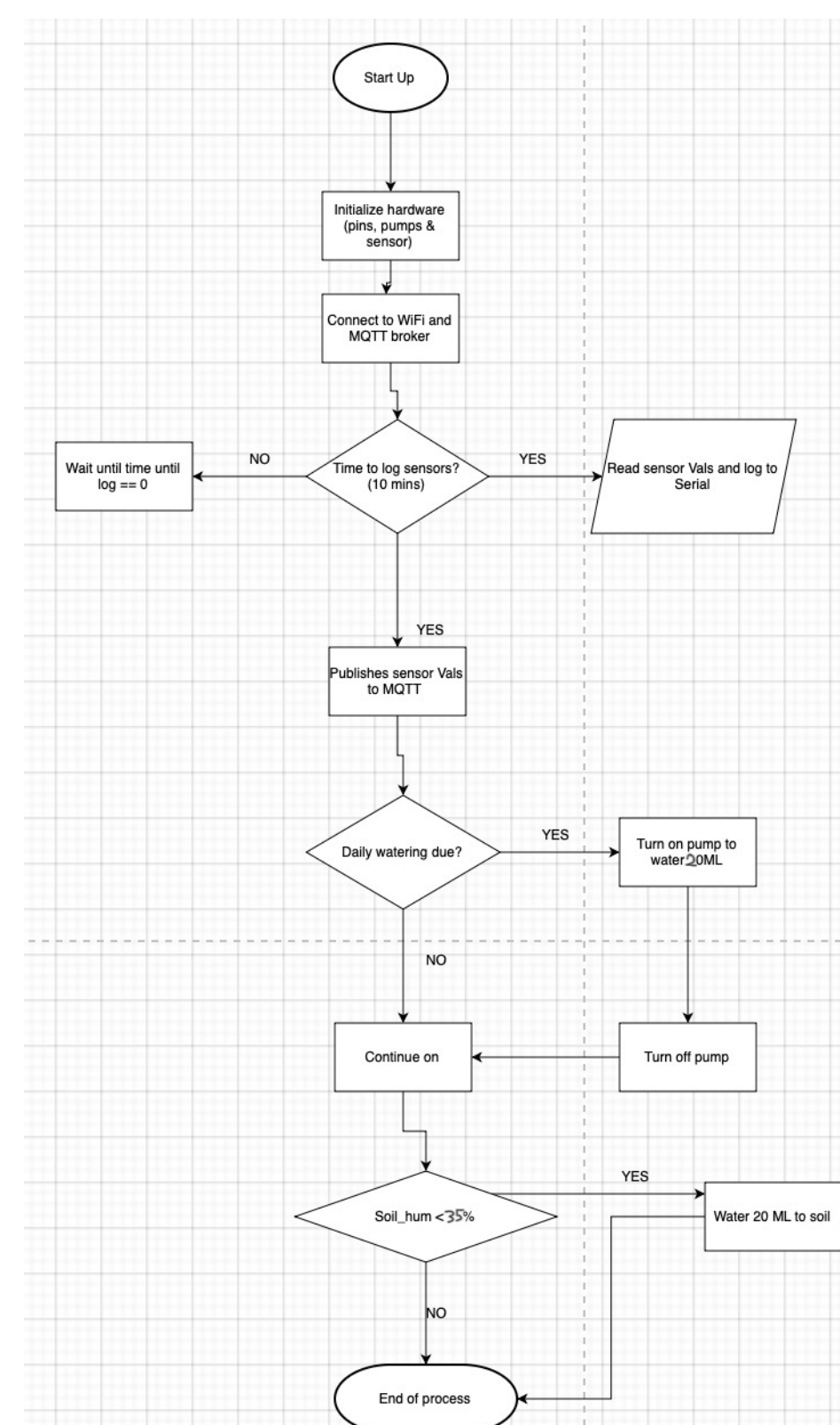
Prototype for lid in solid work



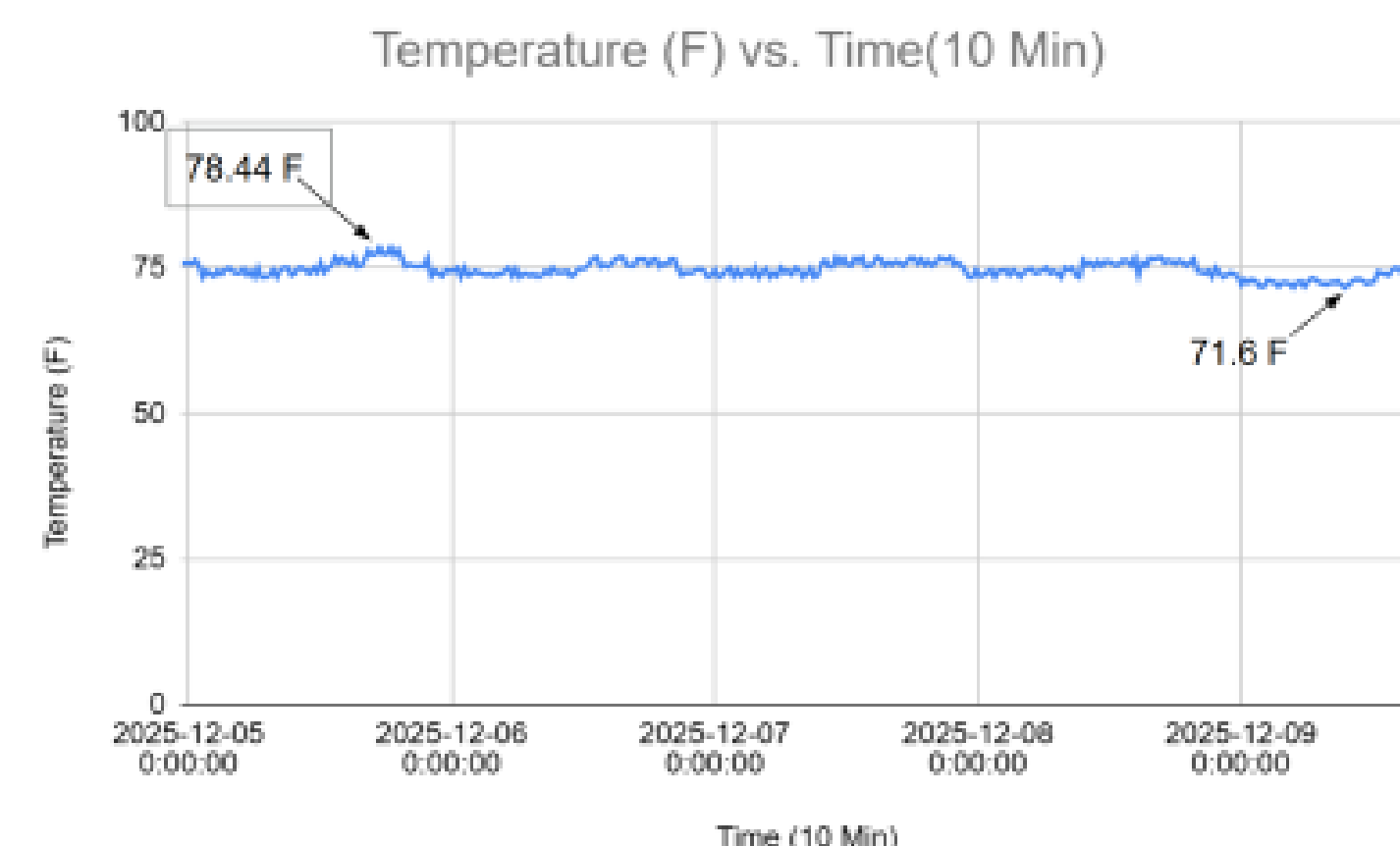
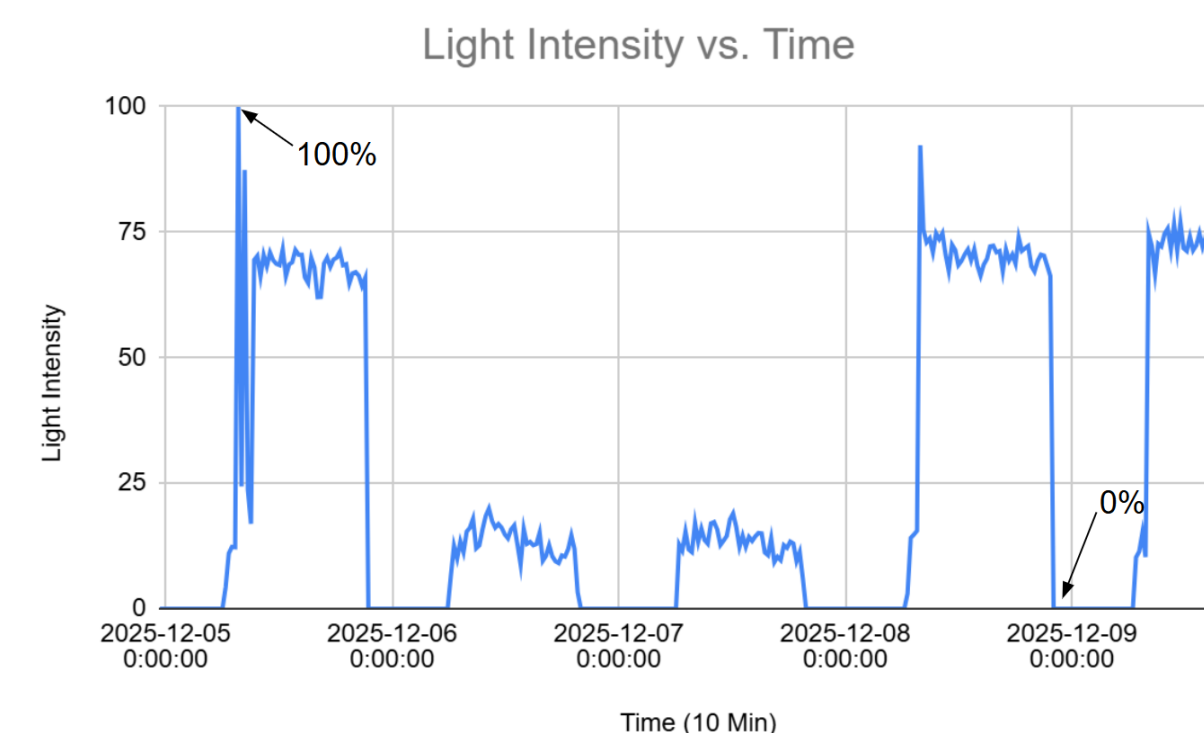
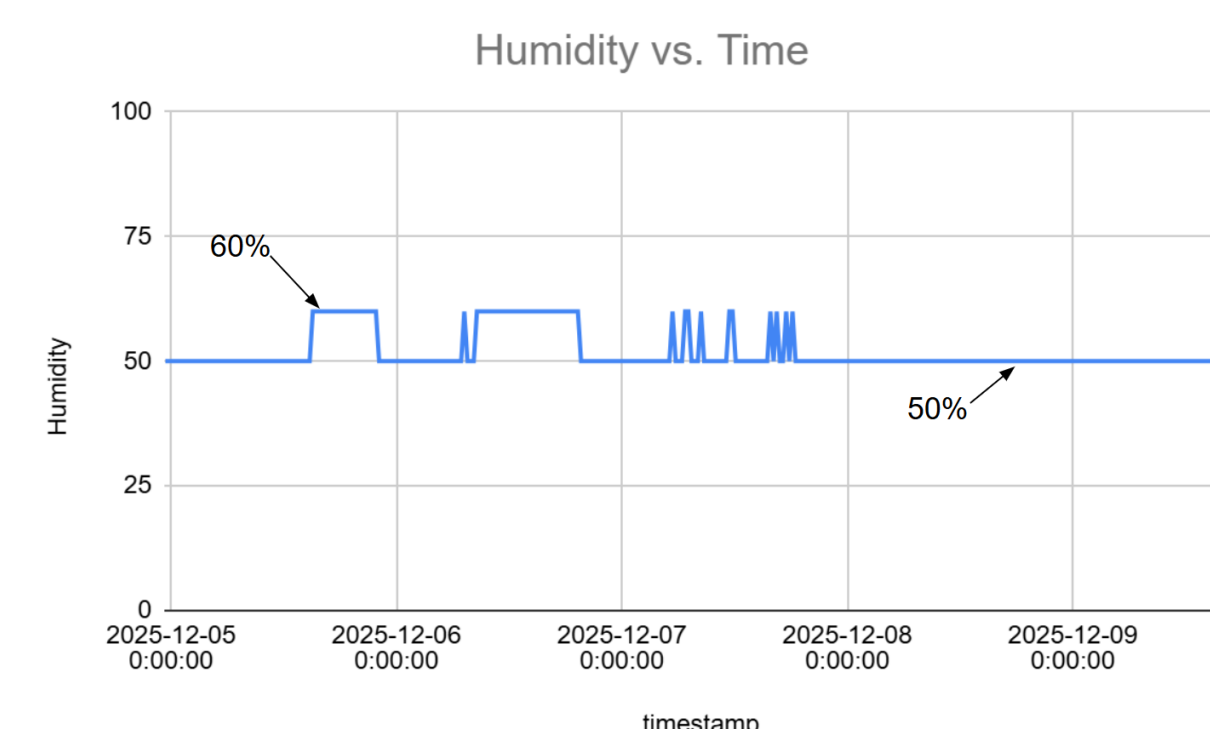
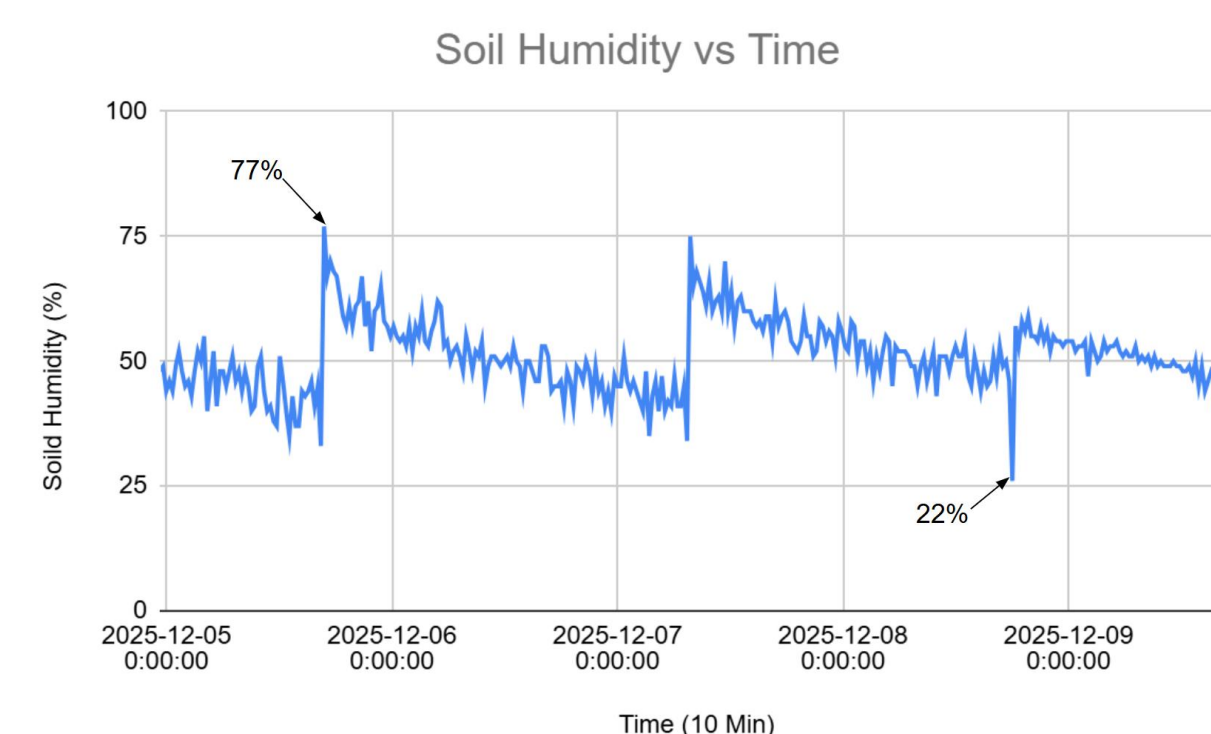
Our prototype in action on the stand with the electrical wiring peak!



Software Flow Chart



Field Measurements and their Graphs:



<https://scanned.page/p/mLHy5L>

QR code for our product demonstration!

Our group explored multiple enclosure concepts before selecting a clean, compact plant-inspired design that keeps all electrical components safely housed inside while maintaining easy access to sensors and wiring. Through iterative adjustments, such as refining internal spacing to fit dot sensor and keep breadboard fitted down, to improving cable routing, and adding delays in the code. We ensured the system updated smoothly on the MQTT network. Our final prototype printed in under the 8-hour limit, deployed successfully for a 3-day sampling period, and consistently met performance expectations during testing. Overall, the system satisfied the design requirements by reliably measuring environmental data, logging it at the correct interval, and supplying water as triggered by soil moisture readings.