

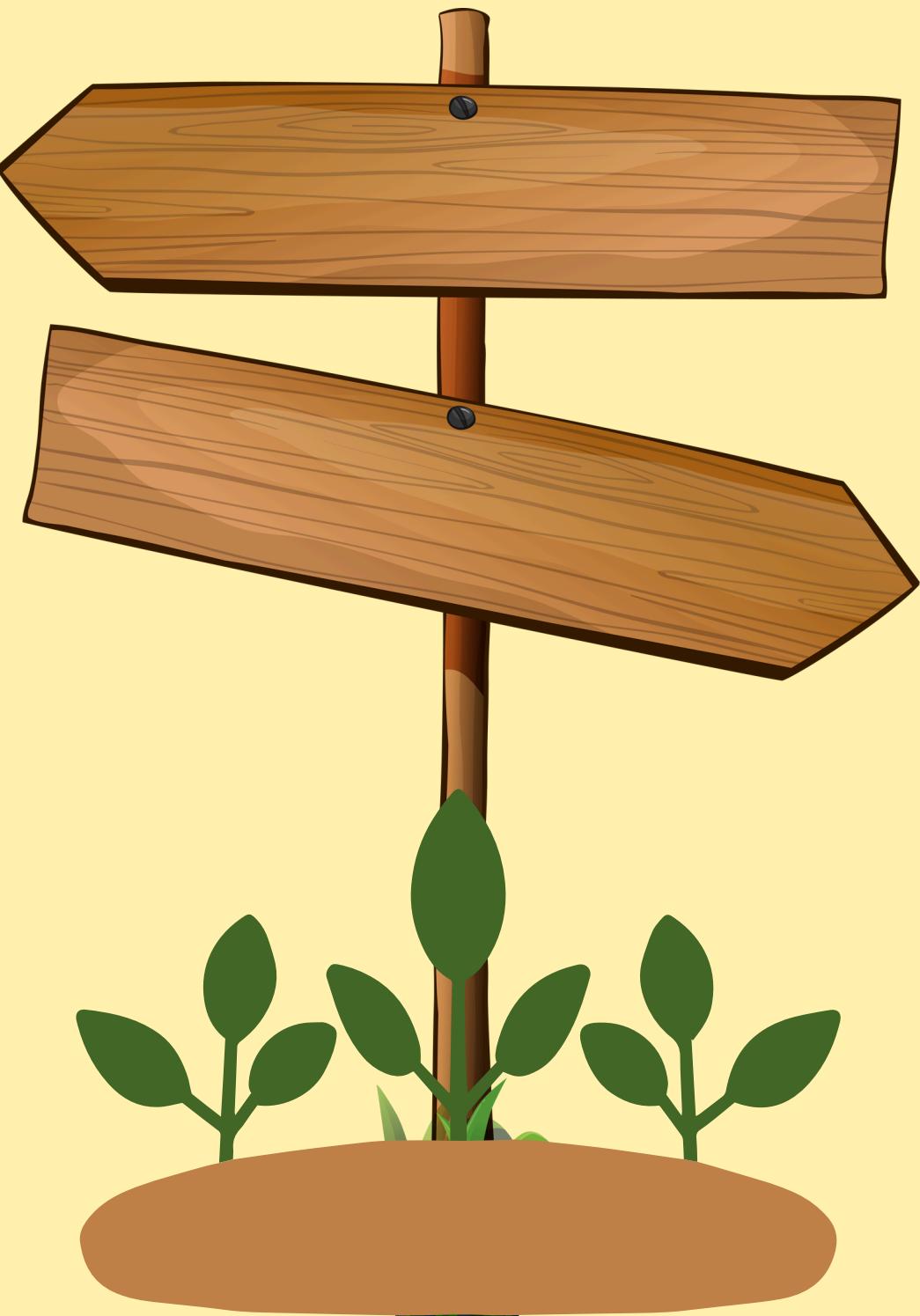
# **FINAL PROJECT**

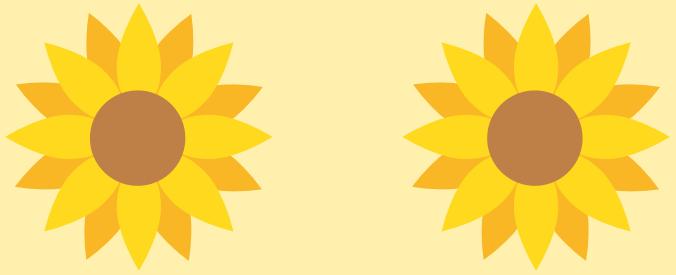
## **IOT-BASED PLANT CARE AND MONITORING SYSTEM FOR POTTED PLANTS**

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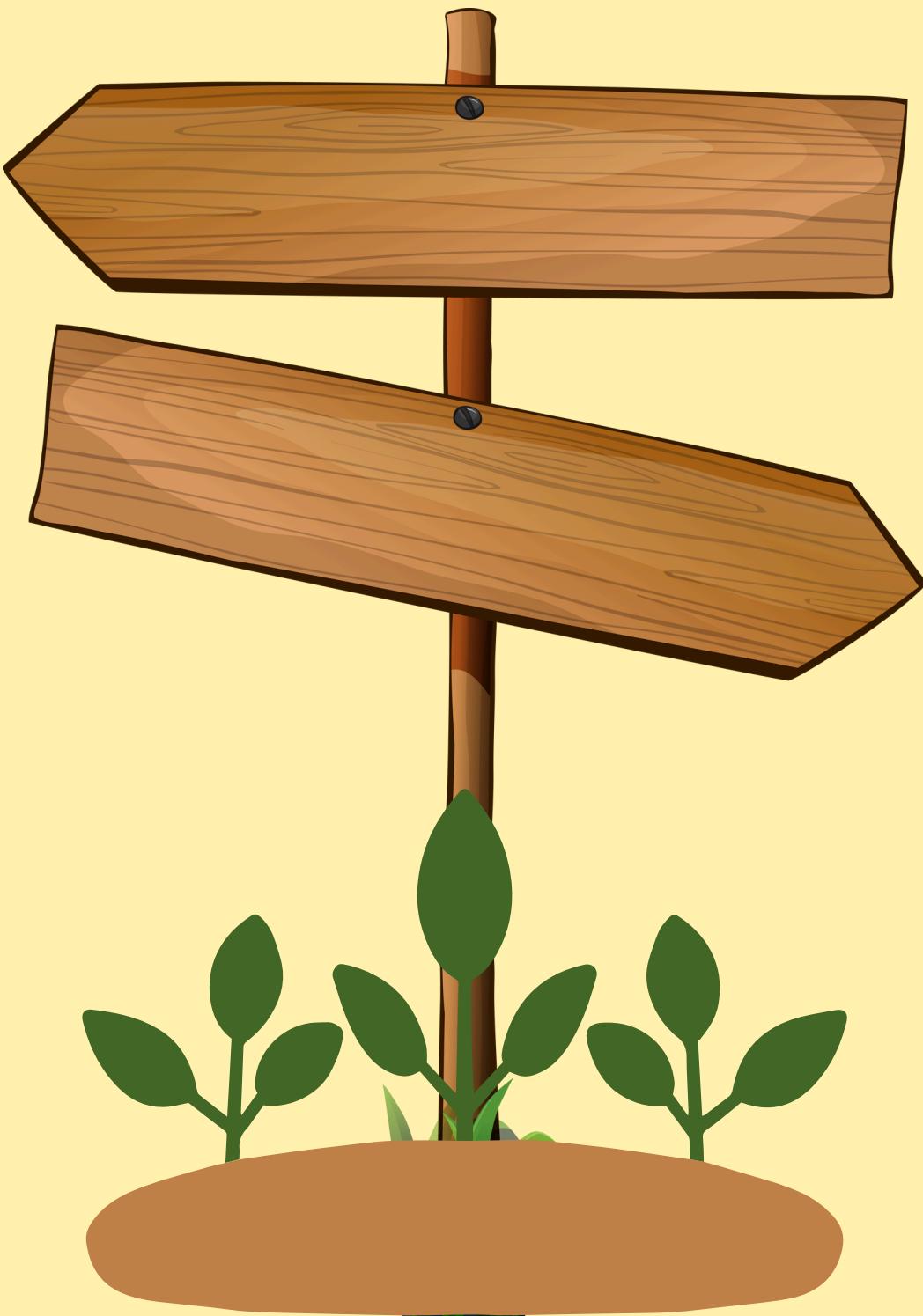
Revanza Reinhard Pflug (2206043523)





# BACKGROUND

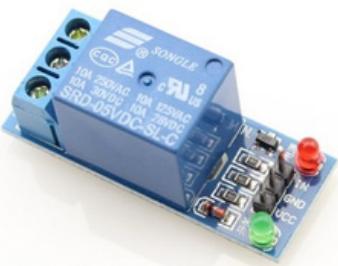
Plants need regular watering and a suitable environment to thrive, but keeping up with these needs can be challenging for busy individuals. IoT technology offers a convenient solution with an IoT-based plant care and monitoring system. This innovative system allows users to monitor and manage their plants remotely via an internet connection, saving time and effort while ensuring optimal care. By combining technology with gardening, it makes plant care more accessible and efficient, helping plants grow strong and healthy.



# COMPONENTS



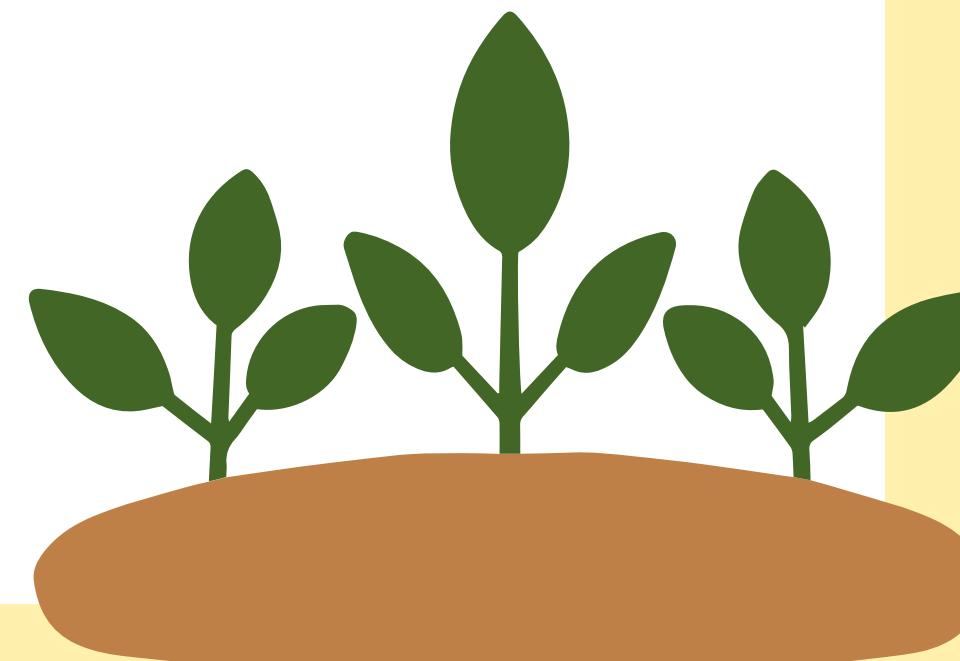
ESP 32 : The ESP32 serves as the central component of the IoT plant care system, enabling remote monitoring and watering management through its Wi-Fi capabilities. It reads data from the soil moisture sensor and controls the relay, automating and streamlining plant care without manual intervention.



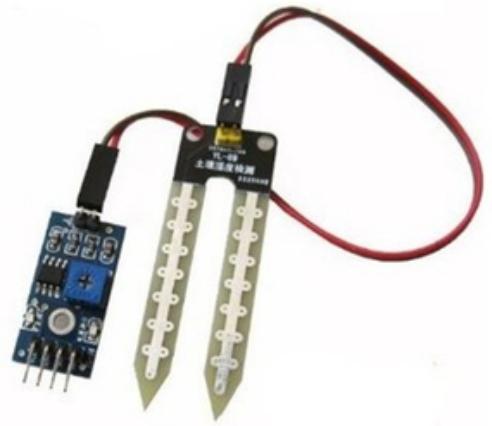
Relay : The relay module acts as an electronic switch in our system. It allows the low-power ESP32 to control high-power devices like the water pump. When the ESP32 detects that the soil is dry, it signals the relay to close the circuit, allowing power to flow to the water pump.



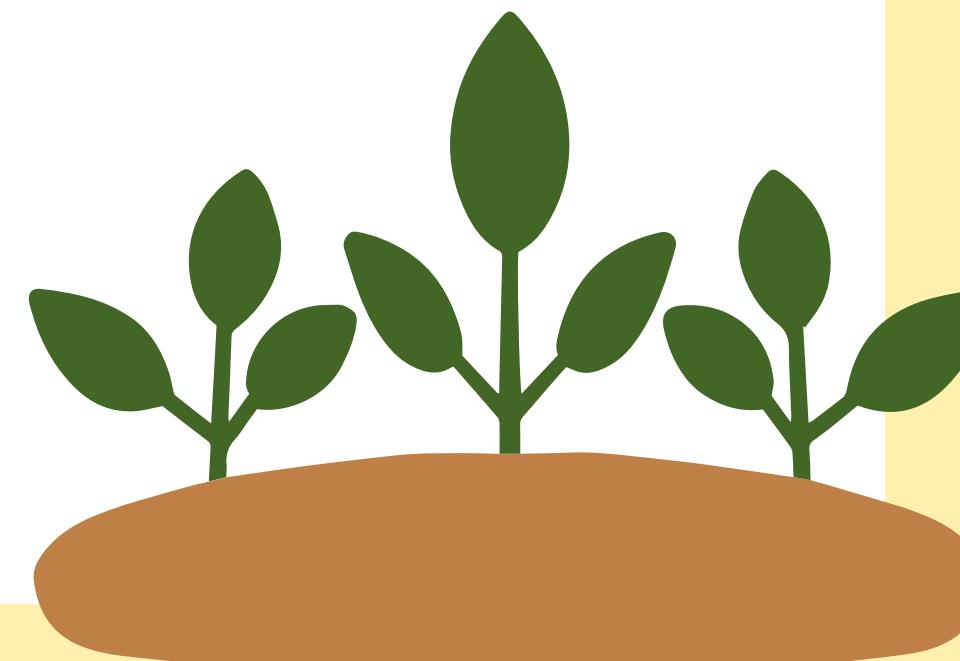
DHT-22 Sensor : The DHT22 is a widely-used and cost-effective temperature and humidity sensor in IoT applications. It provides temperature readings in Celsius and humidity readings as a percentage.



# COMPONENTS



**The YL-69 or Soil moisture Sensor :** A soil moisture sensor is designed to gauge the moisture content in soil. It operates by detecting soil moisture via electrodes placed in the soil. As the soil gets wetter, its electrical conductivity rises, and the sensor generates a reading that mirrors the moisture level.



# PLANT MONITORING AND WATERING SYSTEM

Temperature

°C

Humidity

%

Soil Moisture

%

Temperature & Moisture  
Threshold

25°C

65%

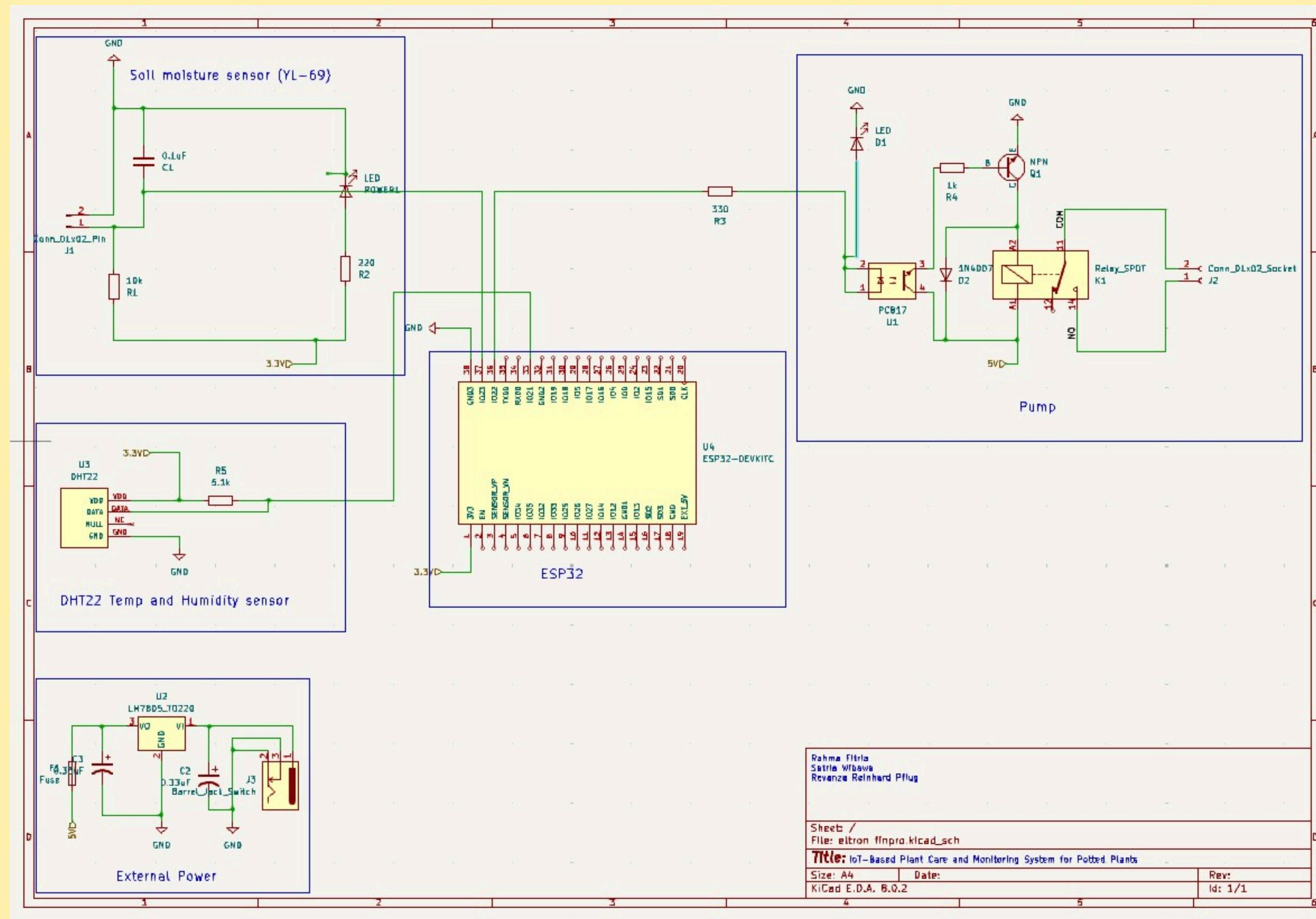
Plant Status

Watered

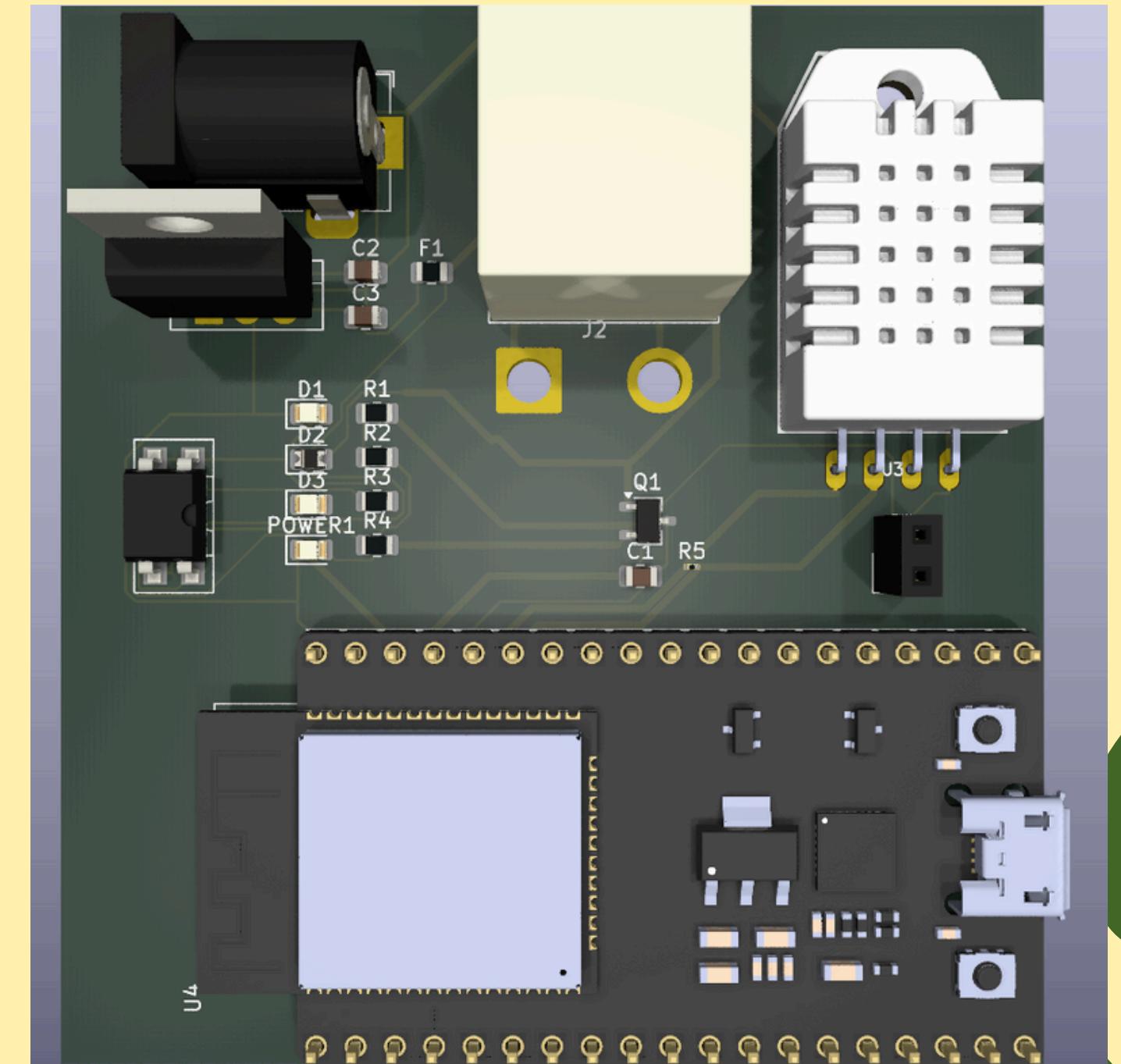
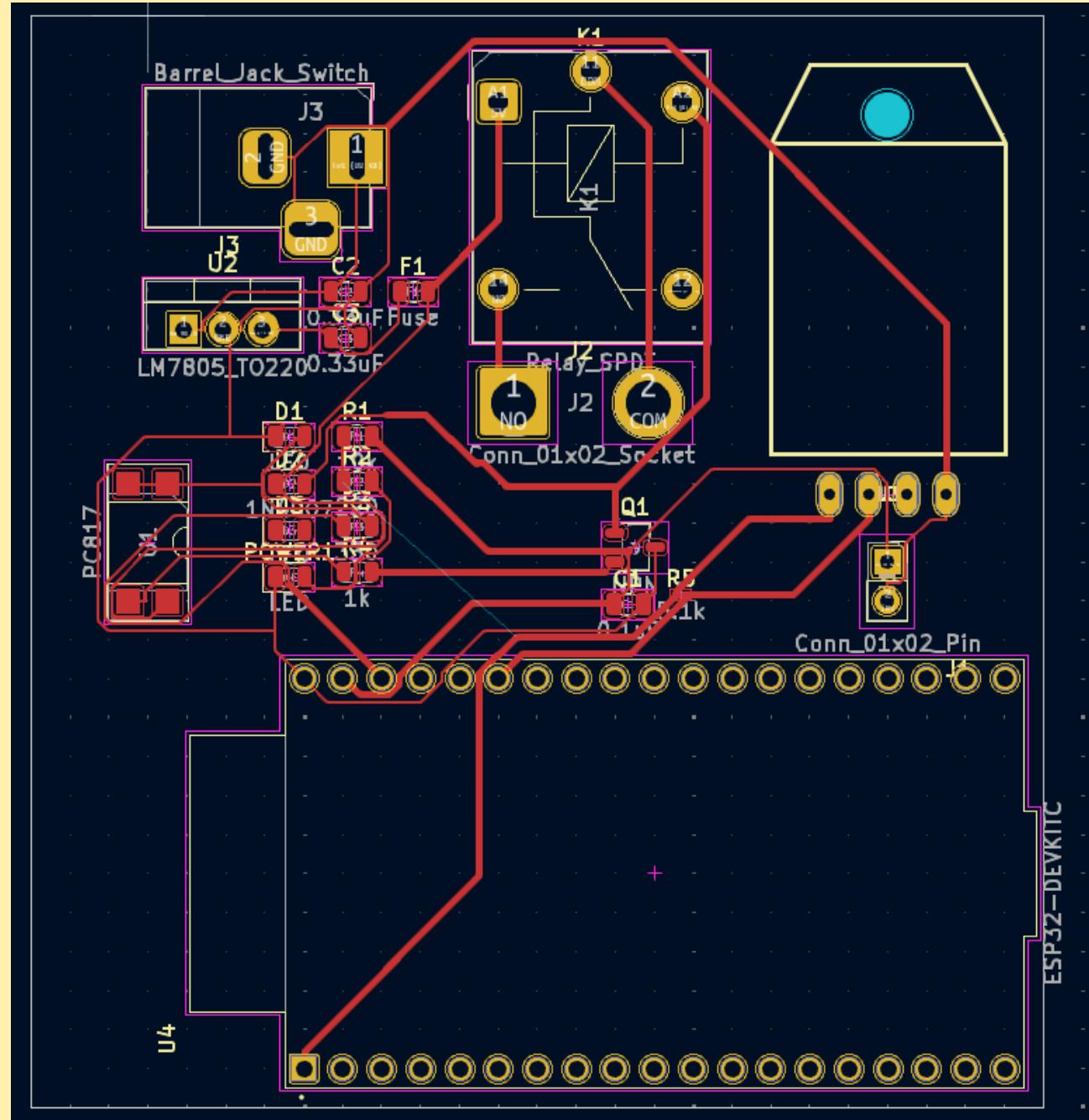
[view log\(s\)](#)



# SCHEMATIC DESIGN

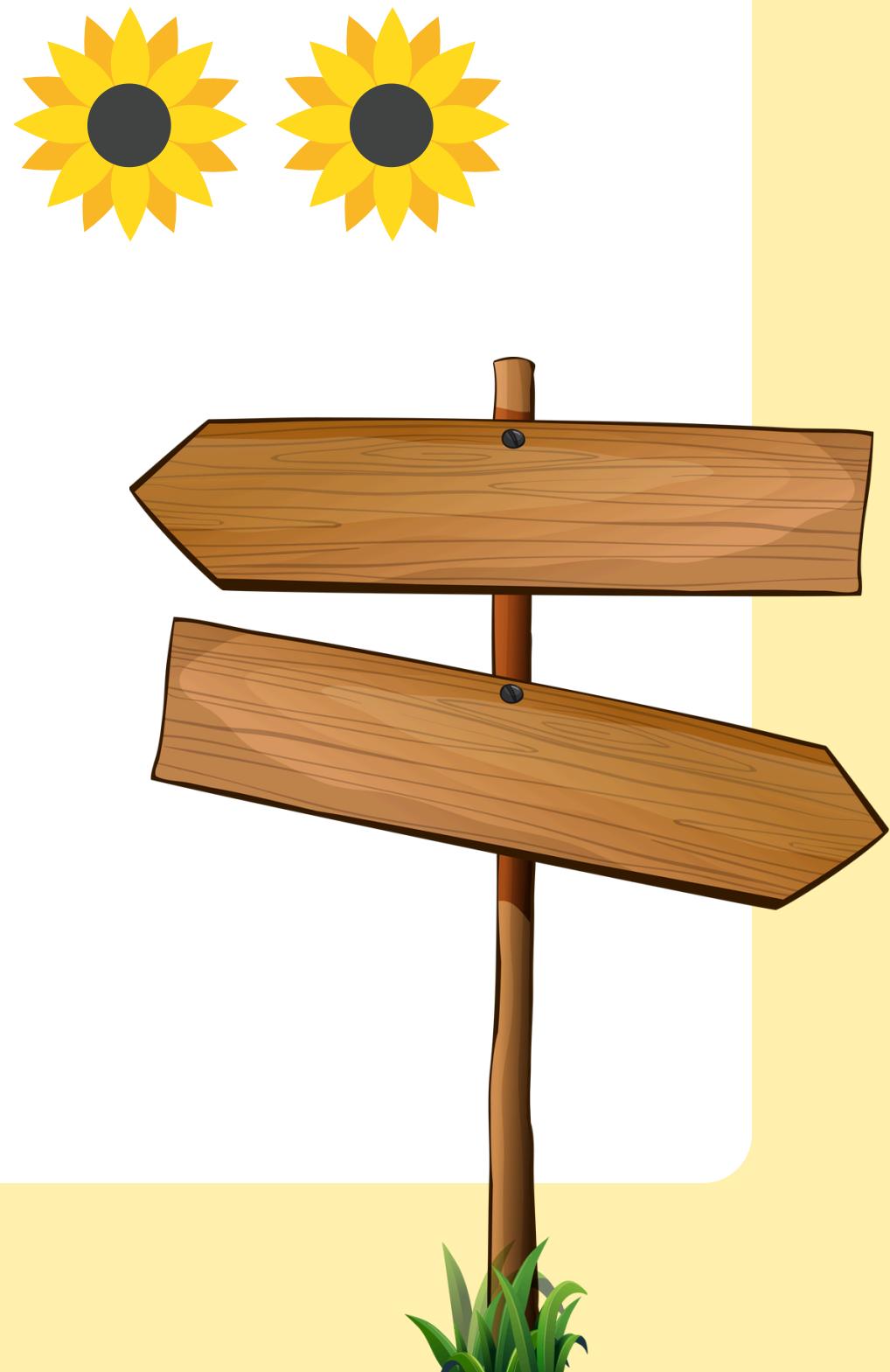


# PCB LAYOUT & 3D MODEL



# HOW THE SYSTEM WORKS

The ESP32 connects to three main components: a 5-volt relay-controlled water pump system, a DHT22 sensor, and a YL-69 soil moisture sensor. These components allow the ESP32 to monitor plant health using a local server. The system tracks soil moisture, temperature, and humidity, with users able to set preferred thresholds. It also logs watering times and offers a barrel jack for external power besides the ESP32's 3.3 input voltage.



# CONCLUSION

- This project implements the use of an ESP32 Microcontroller as a tool for monitoring conditions for a smart plant care system.
- The system is used is to make sure that soil moisture, temperature, and humidity, are in a stable condition. If not then it will trigger the water pump in order to hydrate the plants to ideal conditions.
- The project ensures an simple yet efficient way for plant monitoring, allowing users to check their plant's health whether nearby or checking in remotely.

