

Developing AgroTech Innovations: Revolutionizing Agriculture

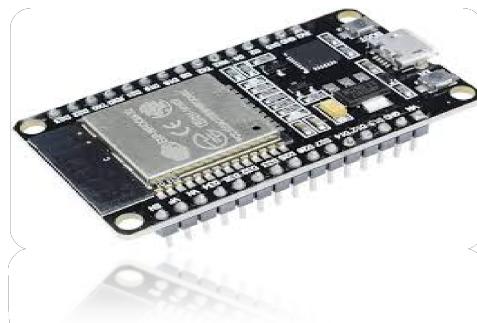
SOFTWARE USED

1. **Blynk IoT software:** Blynk is a well-known IoT platform that makes it easier to create linked and interactive apps for a range of industries, including agriculture. Regarding indoor horticulture, Blynk provides an easy-to-use interface for tracking and managing environmental factors, including humidity, light intensity, and temperature. It is the go-to option for automating indoor gardening systems because of its adaptability and interoperability with a broad variety of hardware components.
2. **Edge Impulse Datasets:** With a focus on edge computing, Edge Impulse is well-known for its proficiency in data analytics and machine learning. Researchers and practitioners in farm automation can develop machine learning models to assess sensor data, spot trends, and decide on optimal plant growth conditions by utilizing Edge Impulse's datasets. By improving the accuracy and efficiency of automated gardening equipment, this data-driven approach optimizes plant growth and yield.

COMPONENT USED

HARDWARE COMPONENTS

1. ESP32 Microcontroller:



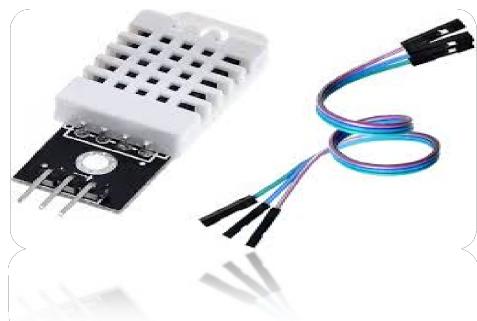
The brains of your project are the ESP32, a potent microcontroller. It offers the connectivity and processing capacity needed to manage and keep an eye on all the parts of your indoor agriculture setup.

2. ESP32 Cam with Breakout Board:



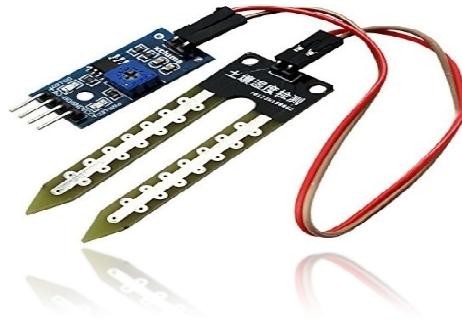
One version of the ESP32 microcontroller that includes a camera module is called the ESP32 Cam. This lets you take pictures or videos of your plants at different phases of growth, which is helpful for tracking and research.

3. DHT22 Humidity and Temperature Sensor:



This sensor measures the surrounding environment's temperature and humidity levels precisely. You can make sure the environment is ideal for plant growth by keeping an eye on these characteristics and adjusting them as necessary.

4. Soil Moisture Sensor:



This sensor detects the amount of moisture in the soil in your plant pots by being embedded in it. It assists you in figuring out when to water the plants so they get the proper quantity of moisture for strong growth.

5. Fan:



The fan aids in controlling the indoor agricultural setup's temperature. The fan can be turned on to move air around and cool the area if the temperature goes above a certain point, protecting the plants from heat stress.

6. 1 Channel Relays:



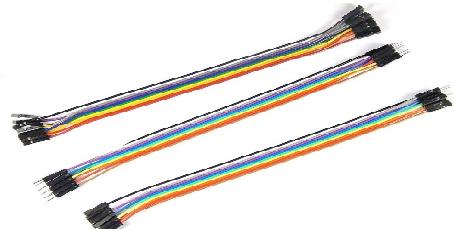
Relays use the low-voltage signals from the ESP32 to control high-voltage components such as the fan and water pump. Based on the sensor readings, they function as switches that let you turn these parts on or off

7. Water Pump:



When the plants require water, the water pump is in charge of providing it. To make sure the plants are properly hydrated, it is managed by the ESP32 depending on the moisture levels found by the soil moisture sensor.

8. Jumper wires:



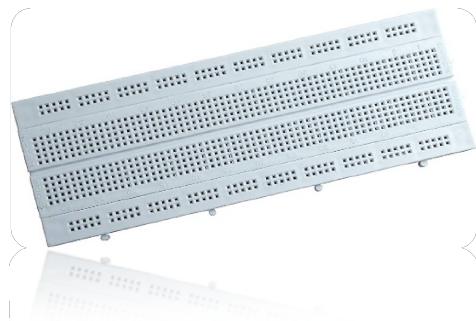
These are used to establish electrical connections between different areas of the circuit or between components on the breadboard. They make it easier for power and signal to go throughout the system.

9. RGB Light strip:



At various growth phases, plants can have their lighting customized using the RGB light strip. You can replicate natural sunshine and encourage photosynthesis, which is necessary for the proper development of plants, by varying the light's hue and intensity.

10. Breadboard:



To build temporary circuits, prototyping tools like breadboards are employed. It's perfect for testing and iterating on your design because it makes connecting the various electronic components of your project fast and simple without the need for soldering.

SOFTWARE COMPONENTS

- **Arduino IDE**

Through the use of the Arduino IDE, code for processing sensor data, relay control, RGB strip, and motor and fan operation may be developed for the ESP32 microcontroller

- **Blynk IoT**

By enabling users to observe real-time sensor data, and remotely manage the system via a Smartphone application, Blynk IoT makes remote monitoring and control possible

- **Edge Impulse Datasets**

Edge Impulse Dataset for data analysis and model training. This helps in our decision-making regarding the environmental factors and plant growth stages.