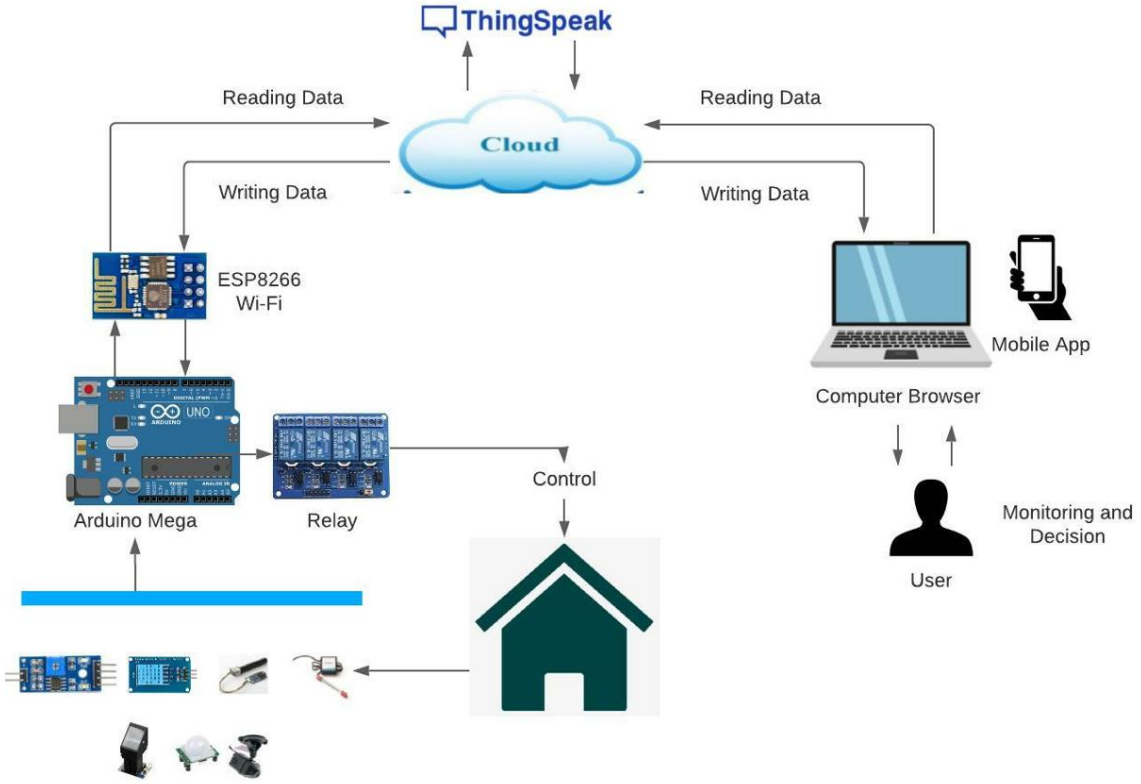
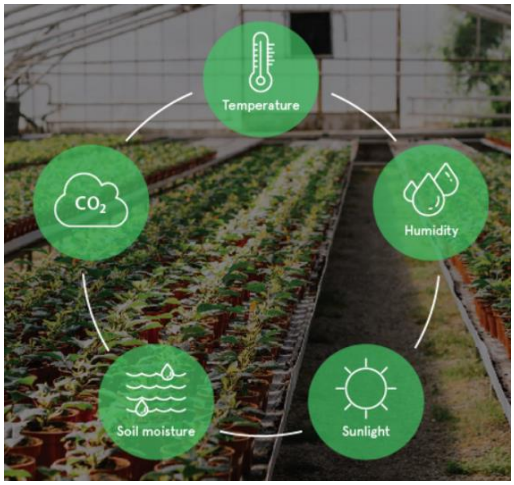
# Advanced Green House Monitoring and Controlling System

## Architecture Diagram :




## Description :

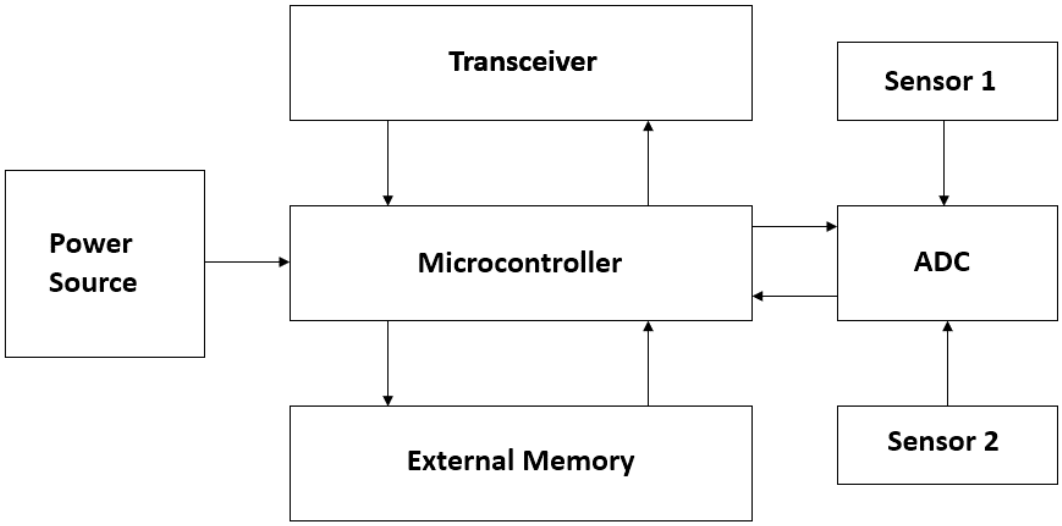
Green house or polyhouse is a place where plants grow in a controlled climatic environment. Polyhouses are designed in a way that it provides favourable atmosphere for the plant to grow. It is necessary to monitor the polyhouse regularly to maintain the climatic parameters which are suitable for the growing plants.



# Advanced Green House Monitoring and Controlling System

To monitor the micro-climate inside the polyhouse sensors need to be employed. In this advanced green house monitoring and controlling system – AGHMCS, different sensors are employed to collect the micro-climatic changes inside the green house. Such sensors are, the soil moisture sensor - to measure the moisture level in the soil, the temperature and humidity sensor – to measure the heat inside the green house and moisture content in the atmosphere, the CO2 sensor – to measure the carbon-di-oxide level, LDR sensor – to measure the light. Sensors are used to collect the data at regular intervals of time. Data collected from the sensors are then sent to the cloud platform for further process.

## Architecture of Sensor node :




The sensors are connected to the Arduino board, which acts as the microcontroller. The Arduino UNO microcontroller is based on the ATmega328. Operating at 5V. It consists of 6 PWM output, 6 analog inputs, 16MHz resonator, a USB connection, a power jack, in circuit system programming header and a reset button. Arduino software allows serial monitor which allows simple textual data to be sent to and from the Arduino board.

We set up all the essential sensors, which are required for the project. At regular time periods, the all the measurements or data from the polyhouse are collected by the respective sensors which are employed for different purposes.

Immediately after the readings are collected, it is sent to the ESP8266 Wi-Fi module. The ESP8266 Wi-Fi module enables the internet connectivity to the embedded applications. It uses TCP/UDP communication protocol to connect

with client/server. Microcontroller communicates with the module using set of AT commands which are also known as attention commands. The microcontroller communicates with ESP8266 Wi-Fi module using UART with specified baud rates, which is the serial communication for fetching data from the sensor. Once the ESP8266 Wi-Fi module receives the information, it submits the collected data to ThingSpeak. This process should be done when each data is collected.

ThingSpeak is an IoT platform service which is cloud-based, allows you to aggregate, visualize and analyse the live data streams in the cloud. It is an automated system for monitoring and controlling the micro-climate and actuator in the polyhouse. The actuators are activated based on the readings measured by the sensor. The user remotely monitors the polyhouse micro-climate to decide the necessary actions to be taken remotely.