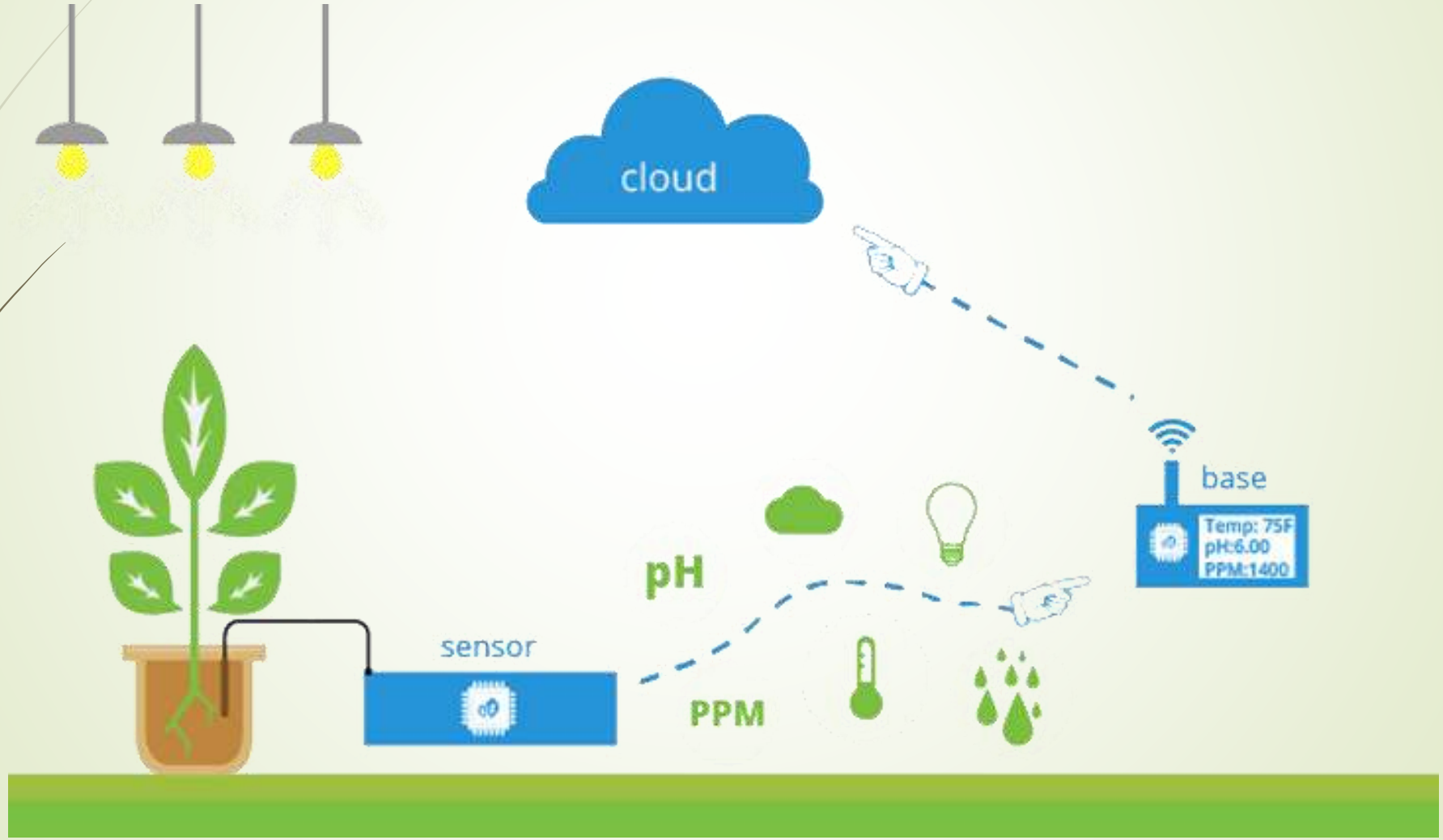
IoT Smart Plant Monitoring System



INTRODUCTION:

The internet of things (IoT) is the network of physical objects such as devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity that enables these objects to collect and exchange data. The IoT allows objects to be sensed and controlled remotely across existing network infrastructure, Using this data, IoT cloud platforms build charts and they have a built-in system to create some business rules on this information.

In this Project we will monitor plant's humidity and temperature with the several sensors. The Project demonstrates processing & remote access to real-time data and we use the data for monitoring the real-time environment of the plant.

COMPONENT

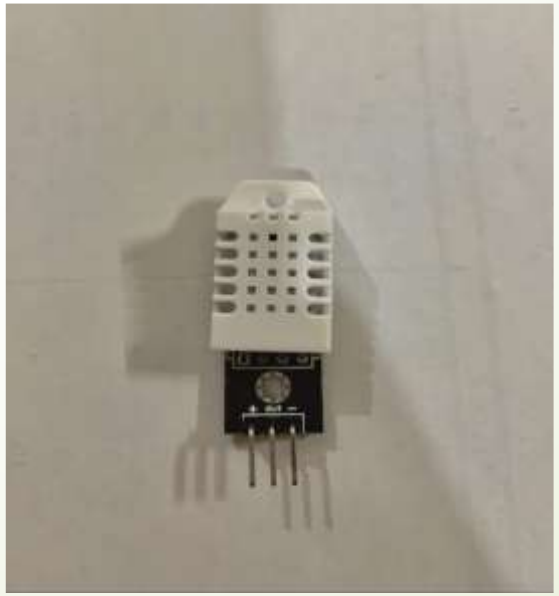
- ESP32 Module
- Breadboard
- Temperature Sensor DHT22
- Resistor
- Jumper Wires
- Arduino IDE

ESP32 MODULE

- ESP32 is a series of low-cost, low-power system on a microcontrollers with integrated Wi-Fi and dual-mode Bluetooth.
- ESP32 is created and developed by Espressif Systems.
- The ESP32 series employs either a Tensilicaa Xtensa LX6 microprocessor in both dual-core and single-core variations, Xtensa LX7 dual-core microprocessor or a single-core RISC-V microprocessor and includes built-in antenna switches, RF balun, power amplifier, low-noise receive amplifier, filters, and power-management modules.

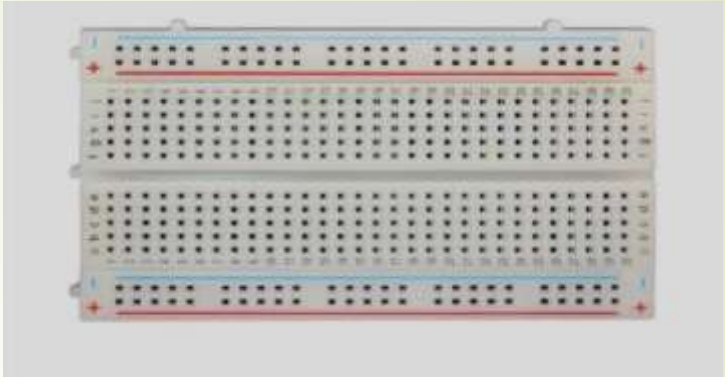
TEMPERATURE SENSOR DHT22

- The DHT22 is a basic, low-cost digital temperature and humidity sensor.
- It use maximum 2.5 mA current during conversion.
- If you want multiple sensors, each one must have its own data pin.
- Its fairly simple to use, but requires careful timing to grab data.
- The only real downside of this sensor is you can only get new data from it once every 2 seconds.



BREADBOARD

- The Bread Board contains spring clip contacts typically arranged in matrices with certain blocks of clips already wired together.
- The components and jump wires are plugged into the clips to create the circuit patterns.



RESISTOR

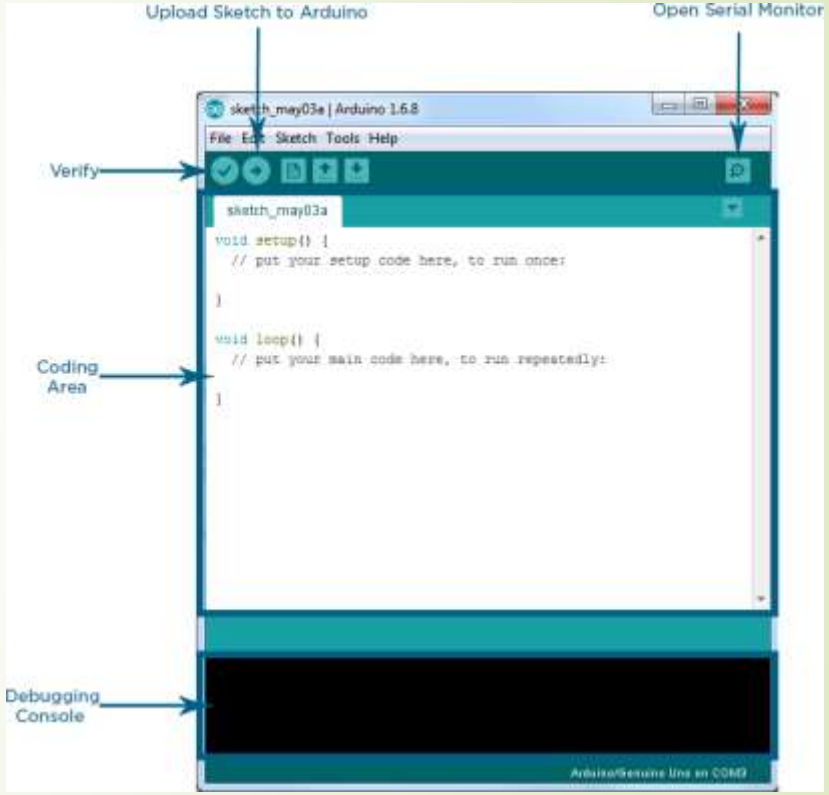
- A passive electrical component with two terminals that are used for either limiting or regulating the flow of electric current in electrical circuits.
- The main purpose of resistor is to reduce the current flow and to lower the voltage in any particular portion of the circuit.

JUMPER WIRES

- A jump wire is an electrical wire, or group of them in a cable, with a connector or pin at each end, which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.

ARDUINO IDE

- Arduino designs, manufactures, and supports electronic devices and software, allowing people around the world to easily access advanced technologies that interact with the physical world.
- Arduino is an open-source electronics prototyping/environment.
- You can also bypass the Boot loader and program the microcontroller through the ICSP(In-Circuit Serial Programming) header.
- It is Highly portable, customizable and has low power consumption.
- It has larger library collection.



WORKING

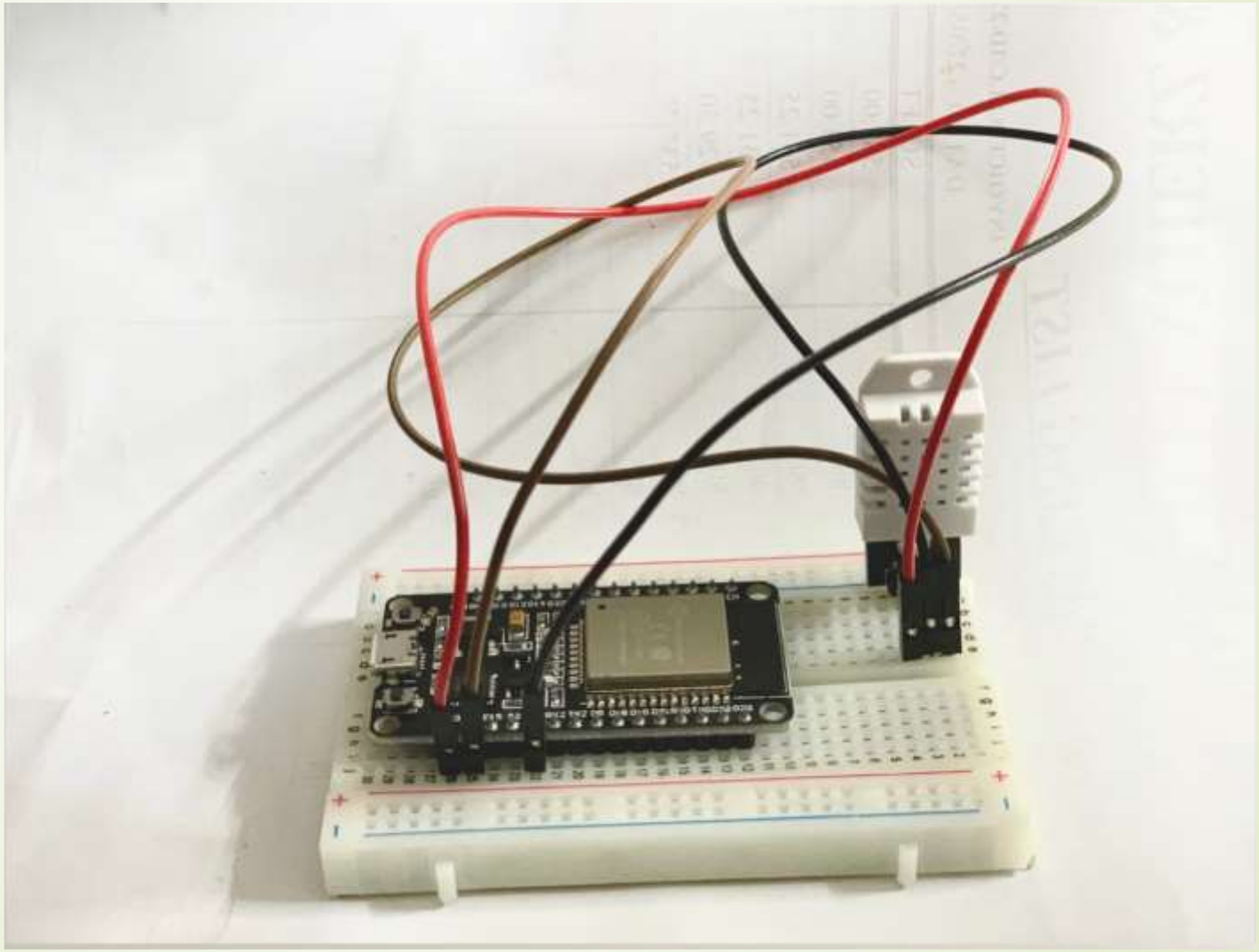
Hardware:

- By connecting temperature sensor DHT22 to bread board positive first four holes with the help of jumper wires.
- Now for ESP 32, first pin of it should be connected to the 3.3V current.
- Second pin is the ground pin, it should be connected to the ground.
- Third pin should be connected to the D4 pin.

Software:

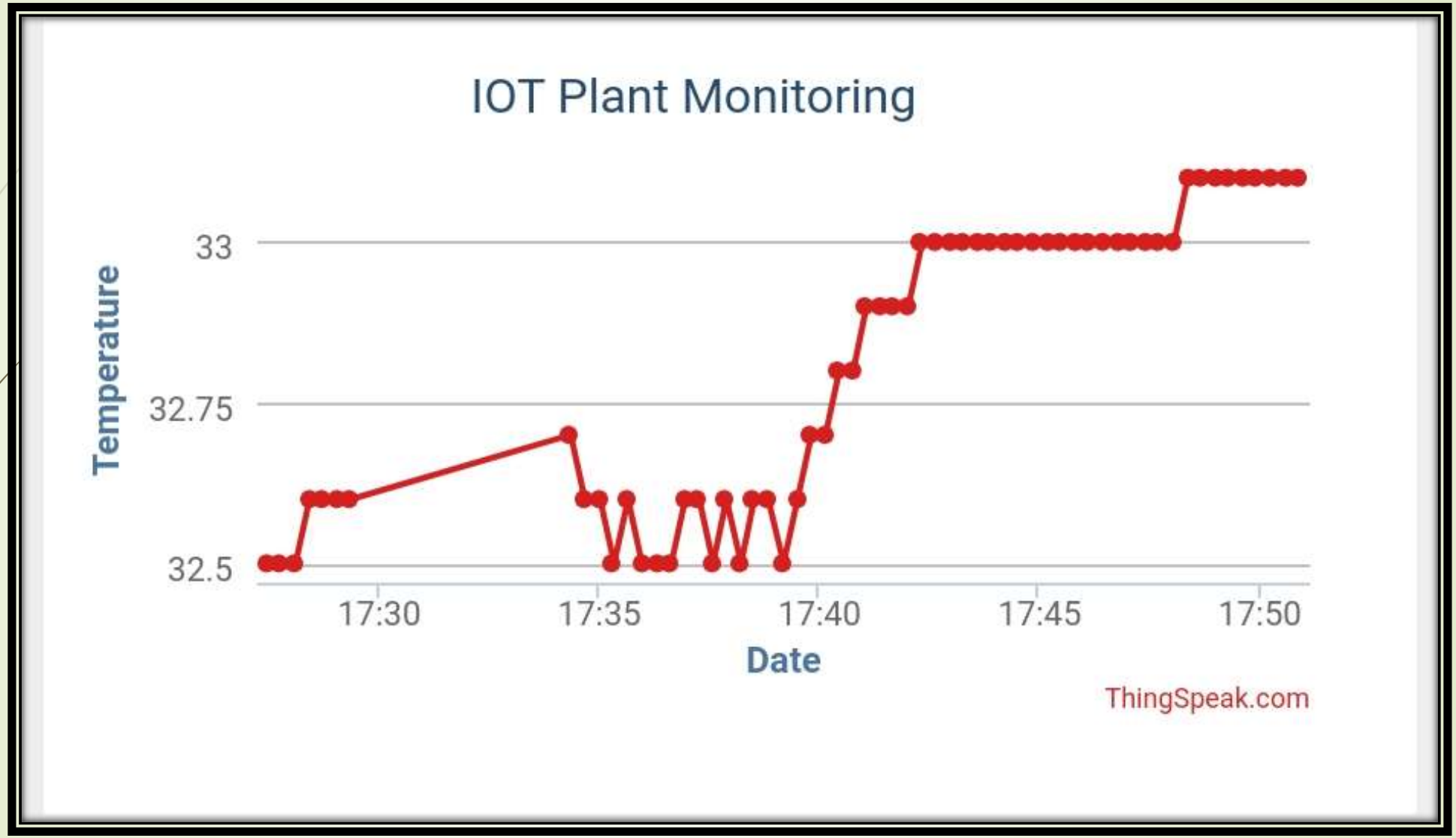
- The two libraries we are using in Arduino are DHT Sensor library and Adafruit Unified Sensor library.
- After preparing hardware, we will execute our temperature sense code in Arduino IDE, with which our hardware and software will be interlinked. and we will get the data at ThingSpeak.

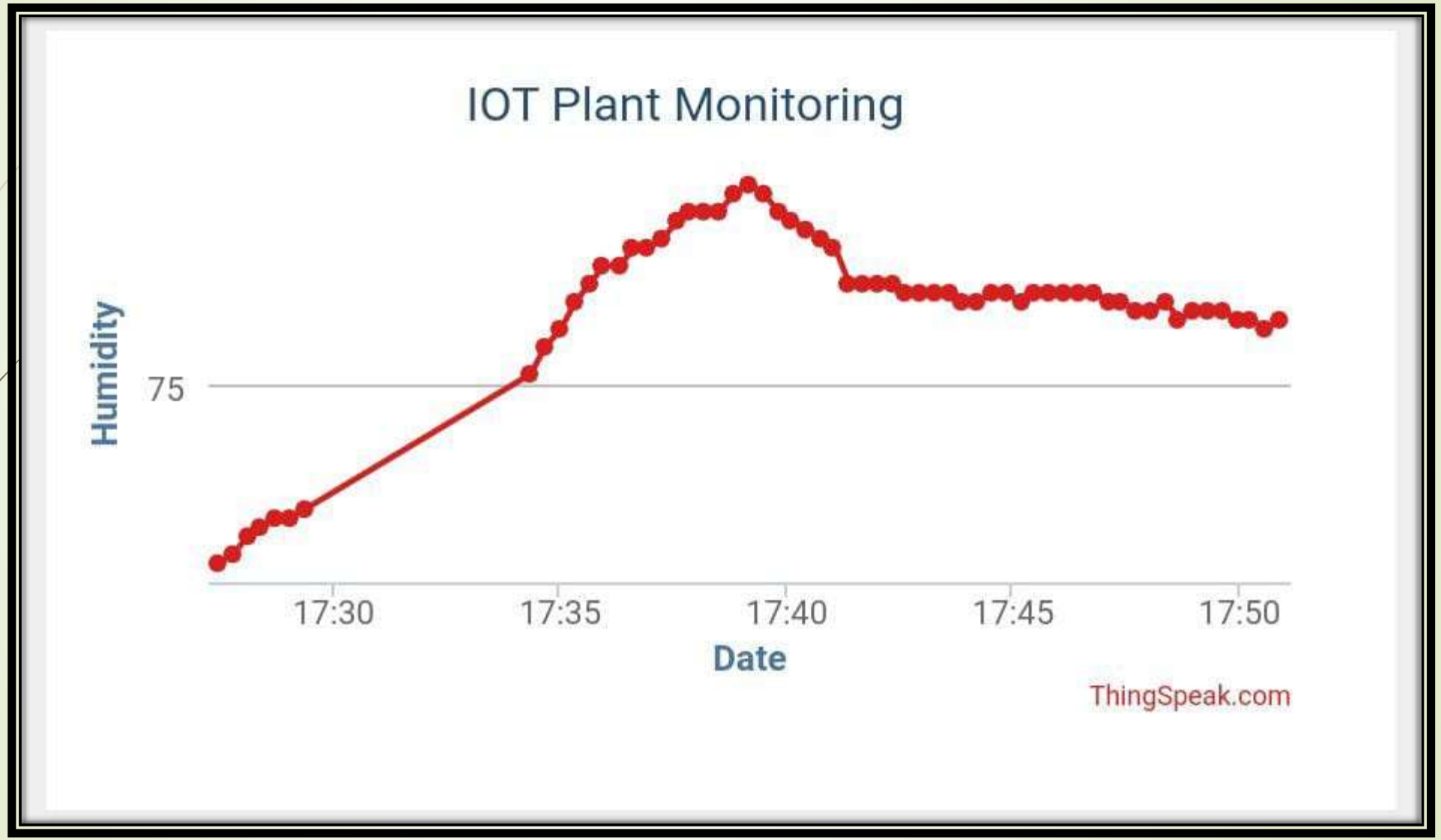
STRUCTURE OF THE SETUP:



THINGSPEAK

- ThingSpeak is an IoT analytics platform service that allows you to aggregate, visualize and analyze live data streams.
- It is often used for prototyping and proof of concept IoT system that requires analytics because it is an open source software.
- ThingSpeak includes a web service that lets you collect and store sensor data in the cloud and develop Internet of Things


IOT Plant Monitoring
Temperature
33
32.75
32.5
17:30
17:35
17:40
17:45
17:50
Date
ThingSpeak.com


IOT Plant Monitoring
Humidity
75
17:30
17:35
17:40
17:45
17:50
Date
ThingSpeak.com

CONCLUSION:

A system to monitor temperature levels in the soil was designed and the project provides an opportunity to study the existing systems, along with their features and drawbacks. Agriculture is one of the most water-consuming activities. The proposed system can be used to keep a record of temperature and humidity on favourable condition of plants i.e sensor values, thereby automating the process of irrigation. Which is one of the most time efficient activities in farming, which helps to prevent over irrigation or under irrigation of soil thereby avoiding crop damage. The farm owner can monitor the process online through a android App. Though this project can be concluded that there can be considerable development in farming with the use of IOT and automation.

Thank You!

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