IoT Project Presentation

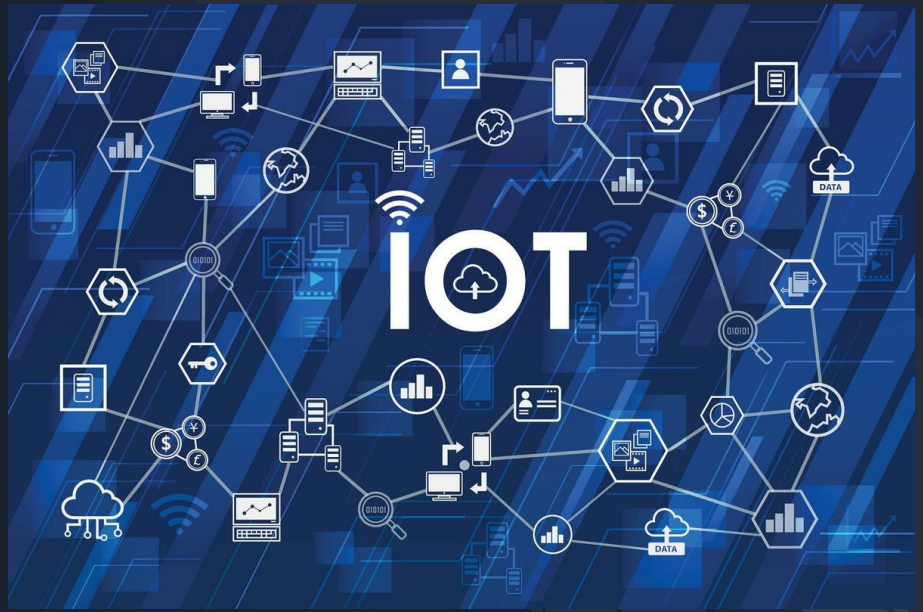
Team : **Humko Campus Bulao**

Members:
Shavak Kansal - 2020101023
Aditya Malhotra - 2020101052
Kushagra Kharbanda - 2020101002
Parth Maradia - 2020111006

What is IoT ?

The Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment

What is IoT ?



Simple Definition:

Internet of Things (IoT) is a simple concept which means taking all the things in the world and connecting them to the internet.

Why IoT ?

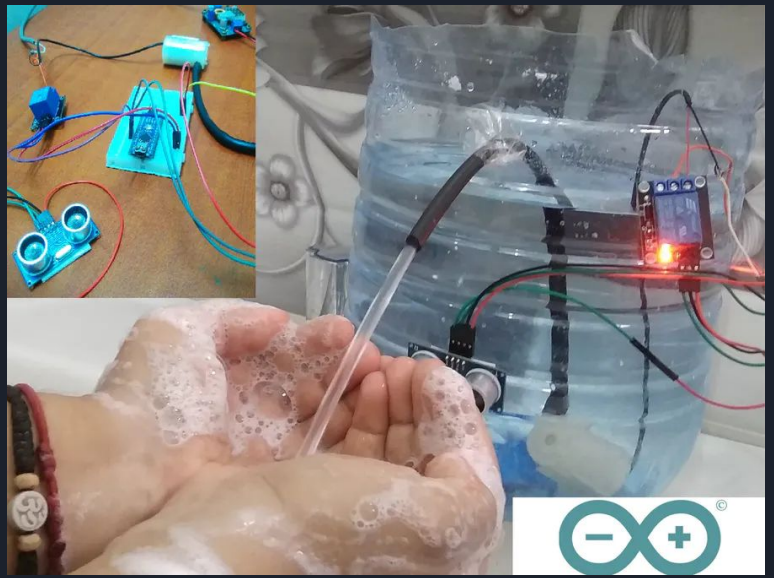
- We are lazy
- We want to see data in real-time
- We want to automate everything
- We want to control everything remotely

What is our Project?

Smart Water Dispenser using oneM2M and ThingSpeak

Objective :

To make a smart faucet which dispenses liquid when someone hovers a hand above the sensor. It also checks for liquid level, and if it is below a certain level it alerts the user.

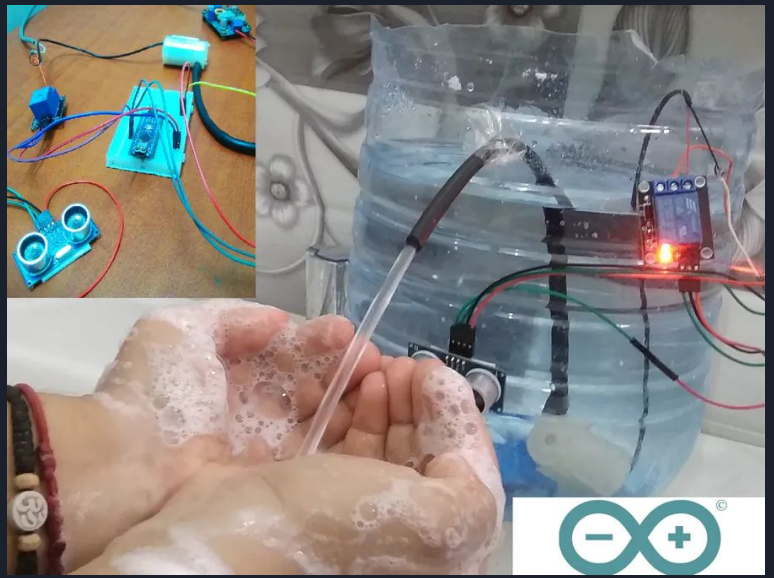


What is our Project?

Smart Water Dispenser using oneM2M and ThingSpeak

How will we use the input :

If the hand is at a certain distance from the sensor then the motor will switch on and remove the obstruction blocking the hole from which water will dispense out. And for the water level sensor sensor we will use it to detect level of water and alert user if level falls below a certain level.

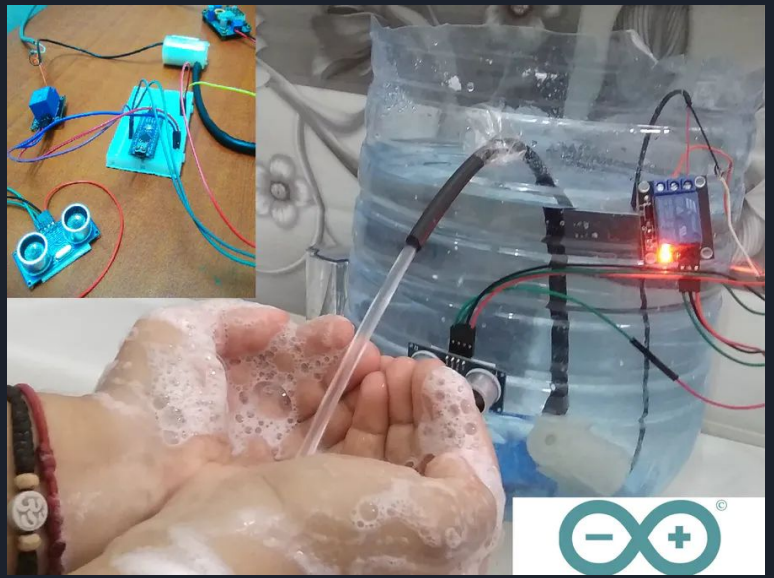


What is our Project?

Smart Water Dispenser using oneM2M and ThingSpeak

Equipment to be used :

Ultrasonic sensor
Jumper wires
Esp32
Submersible Water Pump (3V - 6V)
Relay module
Container
Plastic tube
Battery

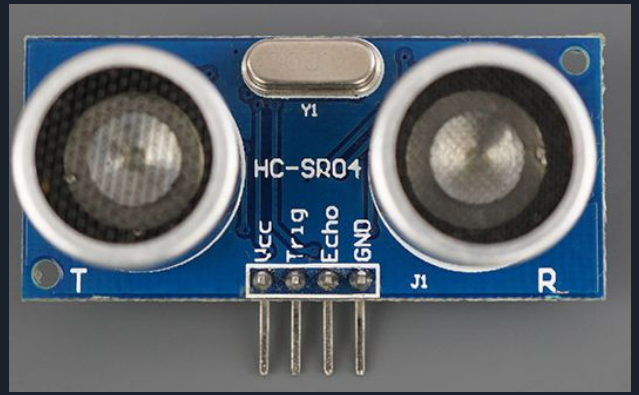


What is our Project?

Smart Water Dispenser using oneM2M and ThingSpeak

Ultrasonic Sensor (HC-SR04)

The HC-SR04 ultrasonic sensor uses sonar to determine the distance to an object. This sensor reads from 2 cm to 400 cm (0.8 inch to 157 inch) with an accuracy of 0.3 cm (0.1 inches), which is good for most hobbyist projects. In addition, this particular module comes with ultrasonic transmitter and receiver modules.



What is our Project?

Smart Water Dispenser using oneM2M and ThingSpeak

Jumper Wire

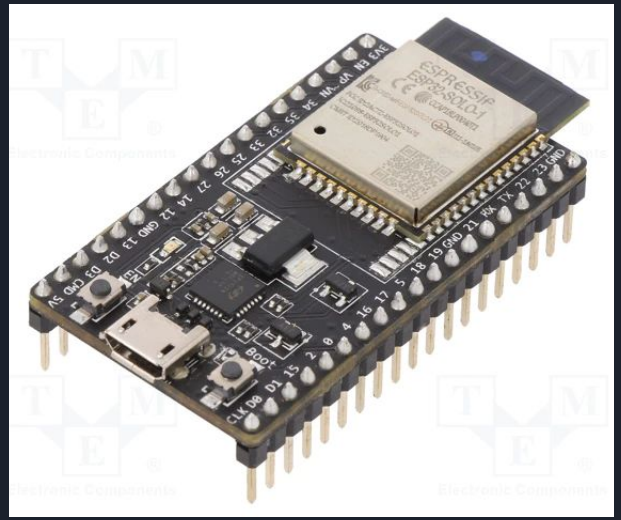
Jumper wires are simply wires that have connector pins at each end, allowing them to be used to connect two points to each other without soldering. Jumper wires are typically used with breadboards and other prototyping tools in order to make it easy to change a circuit as needed.

What is our Project?

Smart Water Dispenser using oneM2M and ThingSpeak

Esp32

ESP32 is a series of low-cost, low-power system on a chip microcontrollers with integrated Wi-Fi and dual-mode Bluetooth. It can perform as a complete standalone system or as a slave device to a host MCU, reducing communication stack overhead on the main application processor.



What is our Project?

Smart Water Dispenser using oneM2M and ThingSpeak

Submersible Water Pump (3v - 6v)

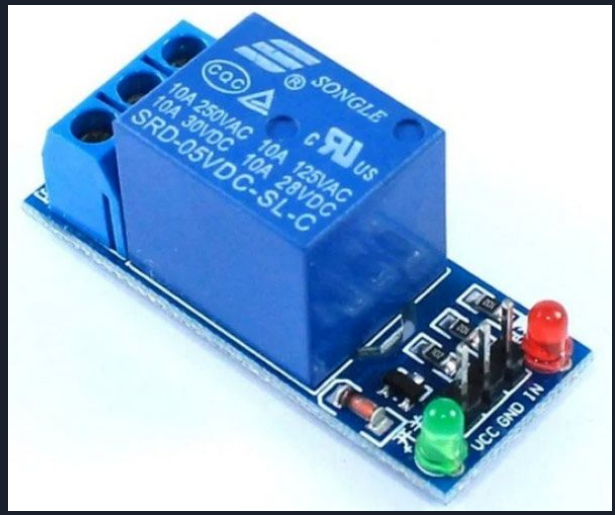
Submersible Water Pump DC 3V - 6V works using water suction method which drain the water through its inlet and released it through the outlet. We can use the water pump as exhaust system for your aquarium and controlled water flow fountain.

What is our Project?

Smart Water Dispenser using oneM2M and ThingSpeak

Relay Module

A power relay module is an electrical switch that is operated by an electromagnet. The electromagnet is activated by a separate low-power signal from a microcontroller. When activated, the electromagnet pulls to either open or close an electrical circuit



What is our Project?

Smart Water Dispenser using oneM2M and ThingSpeak

Physical Quantities measured:

Liquid level

Times when hand detected

Times when refilled

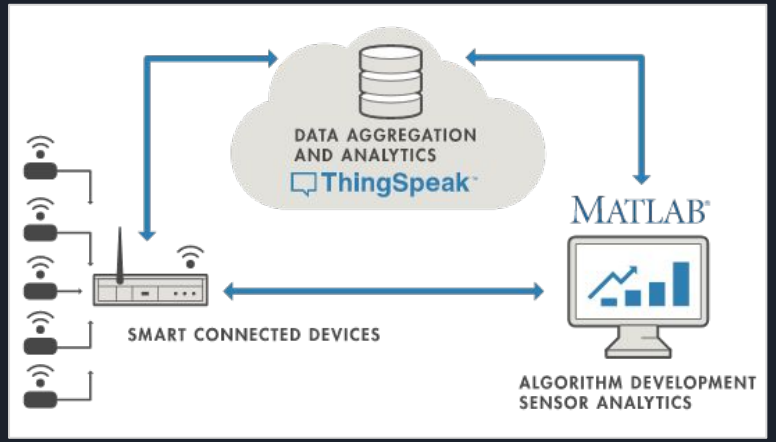
What is ThingSpeak ?

- It is a open source cloud platform mainly used for IoT Projects.

- It lets you to collect and store sensor data in cloud.

- It helps to aggregate, visualize and analyze live data streams.

- Provides instant visualization of data on the fly.



What is ThingSpeak ?

Analytic IoT platform

- Collect data from sensors, "things"
- Visualize data instantly
- Has more than 60,00 users

Analyze data

- MATLAB integration allows users to run scheduled code on data coming into ThingSpeak

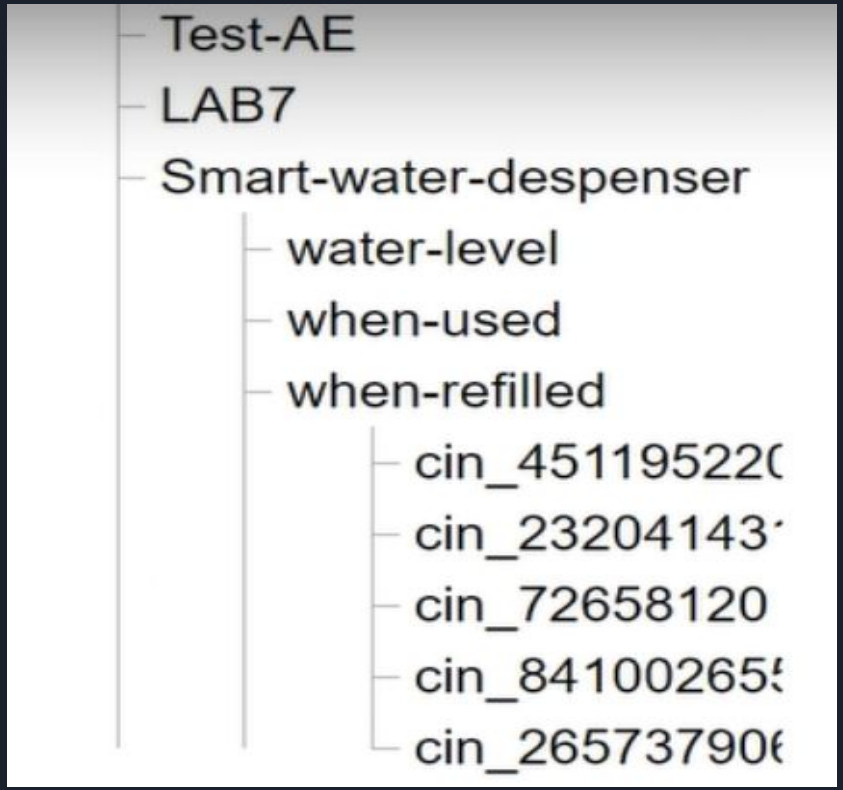
Act on data

- E.g. send a tweet when the temperature in your backyard reaches 32 degrees.

What is OneM2M ?

- A global initiative to develop IoT standards to enable interoperable, secure, and simple-to-deploy services for the IoT ecosystem.
- Allow any IoT application to discover and interact with any IoT device.
- IoT solutions can interoperate across silo boundaries.
- Reduce fragmentation, increase reusability and improve the cost base through economies of scale

OneM2M Resource Tree



Motivation of the Project

- COVID-19 is an infectious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2). It has affected millions of people and has claimed the lives of hundreds of thousands of people from all over the world. This disease affects different people in different ways. Some people may develop mild to moderate illness and recover without special treatment or hospitalisation, while some may develop severe illness and even die.

- The incubation period of this virus, on average 5-6 days but it could also be up to 2 weeks. During this period, the person may not experience any symptoms but could still be contagious. The person will be a virus carrier and easily spread it when he/ she does not take any precautionary measures.

- Coronavirus during its peak spread rapidly and affected many countries. While some countries are recovered, other countries are still in lockdown and some are suffering from the waves of new variants of coronavirus.

How can the spread of coronavirus be controlled?

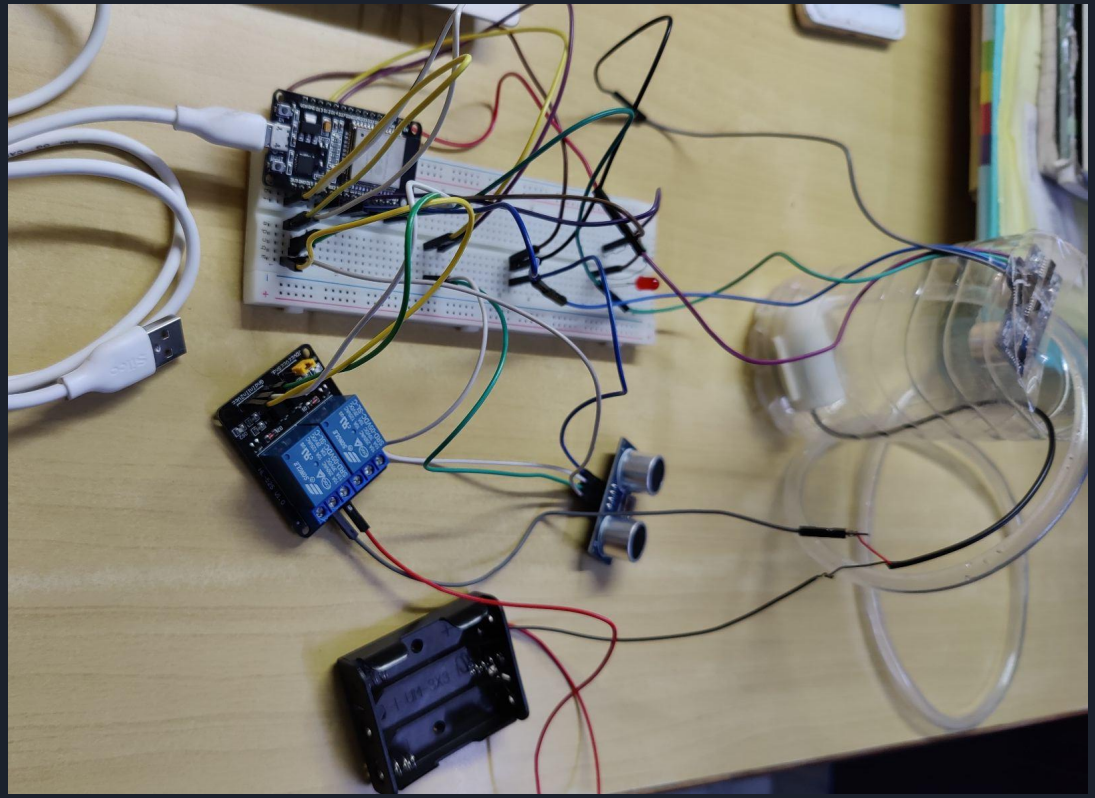
- COVID-19 Two main factors that contribute to spread of virus: Standing in close proximity with an infected person and Touching a contaminated surface.

- The former can be prevented by maintaining social distance in public wearing and following healthy practices like wearing 7 layered face mask, wearing face shield, avoid spitting or coughing in open etc.

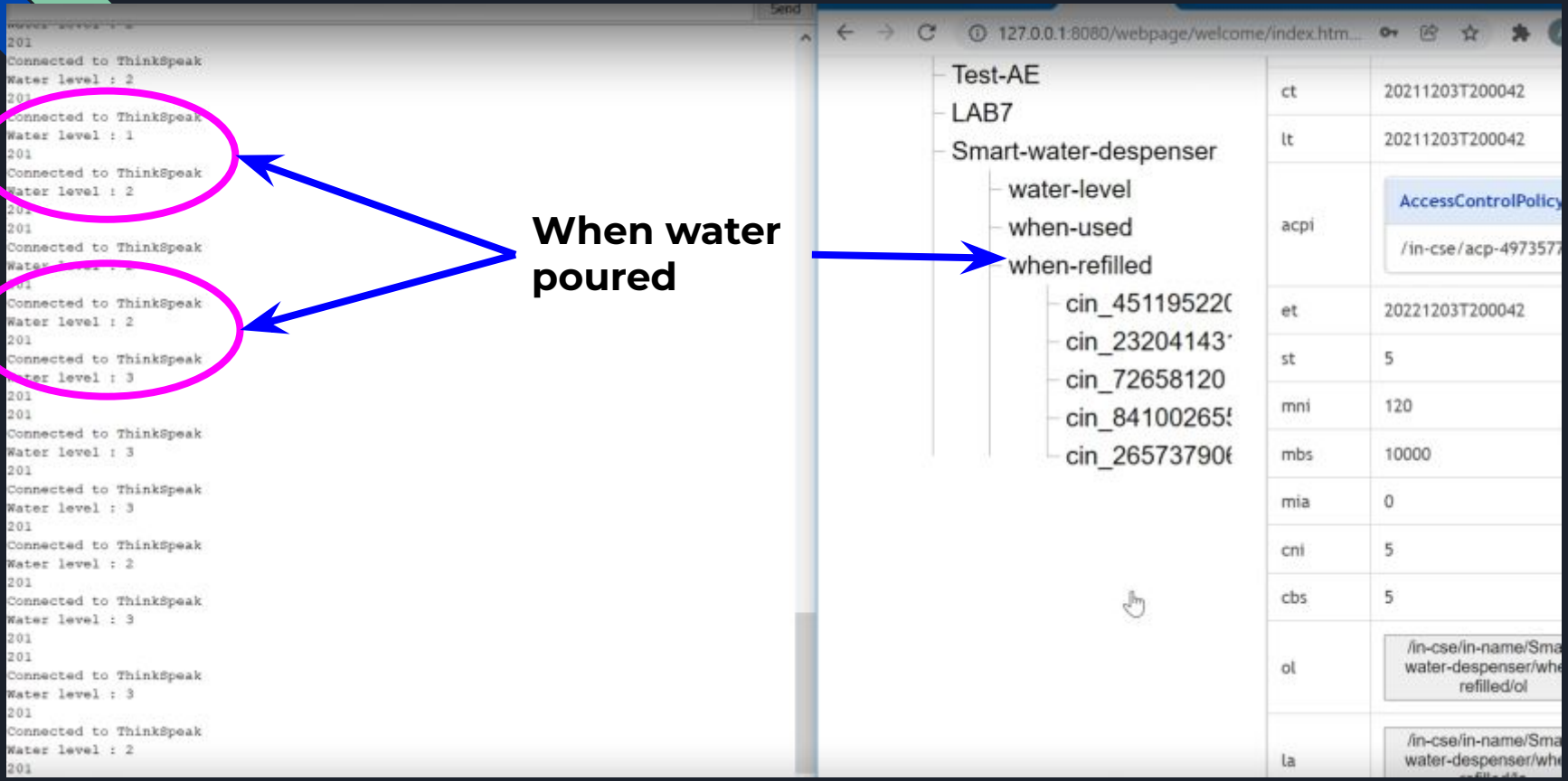
- The later can be prevented by washing our hands properly for at least 20 seconds with soap as it is effective at killing the virus.But, Sometimes we could touch the faucet carelessly after we wash our hands and the faucet could be contaminated. The person would then touch his/ her eyes, nose or mouth, and he/she has a higher chance of contracting this coronavirus disease.

- To prevent this from happening, we created a smart water dispenser.

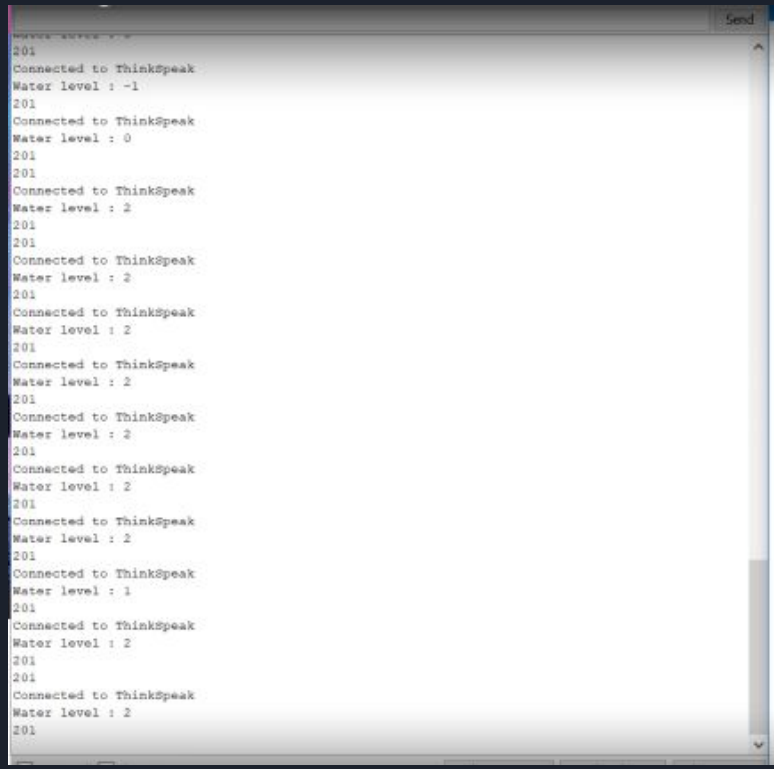
Design

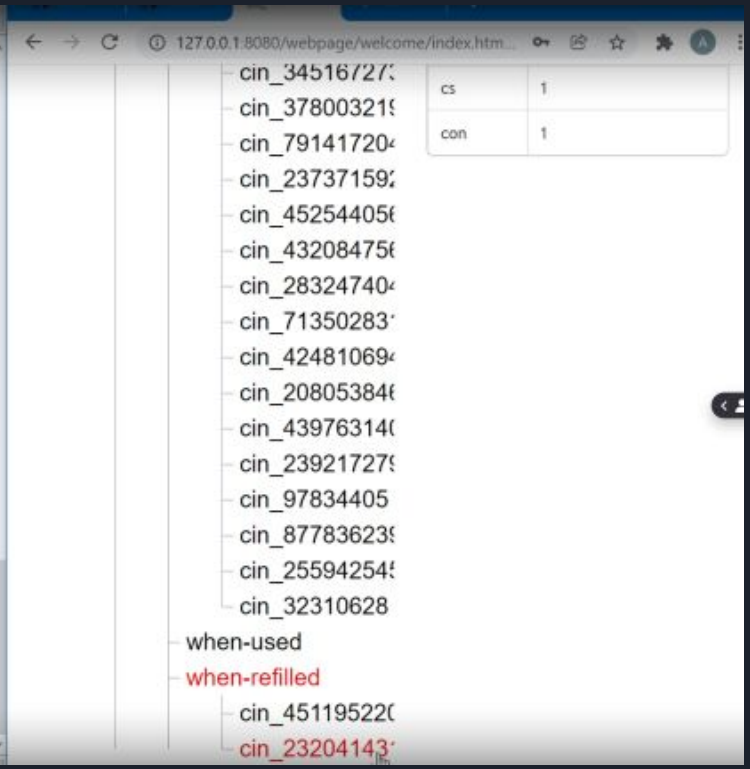


SnapShots of Project

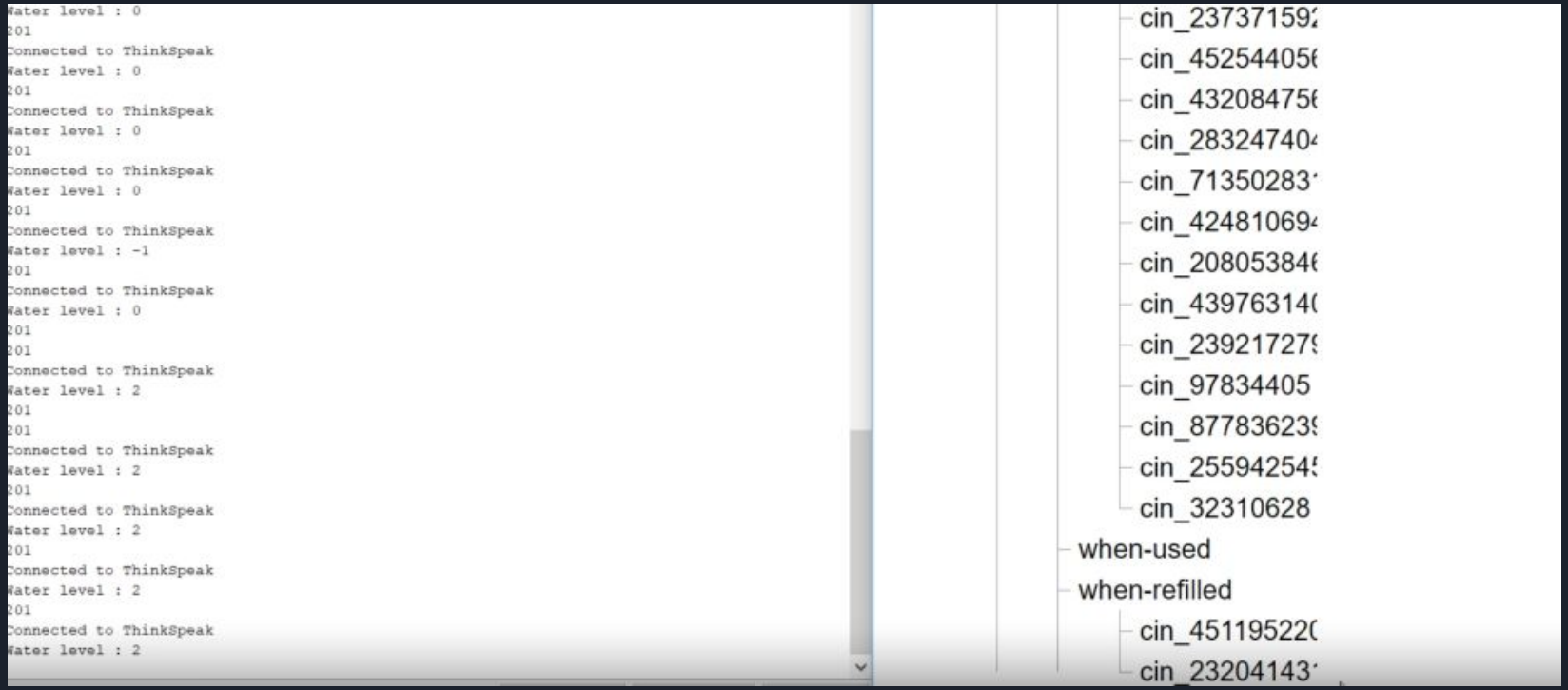


SnapShots of Project



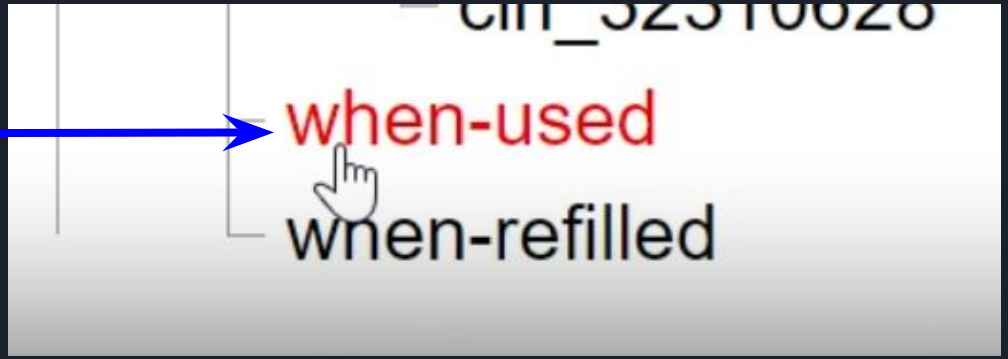


SnapShots of Project

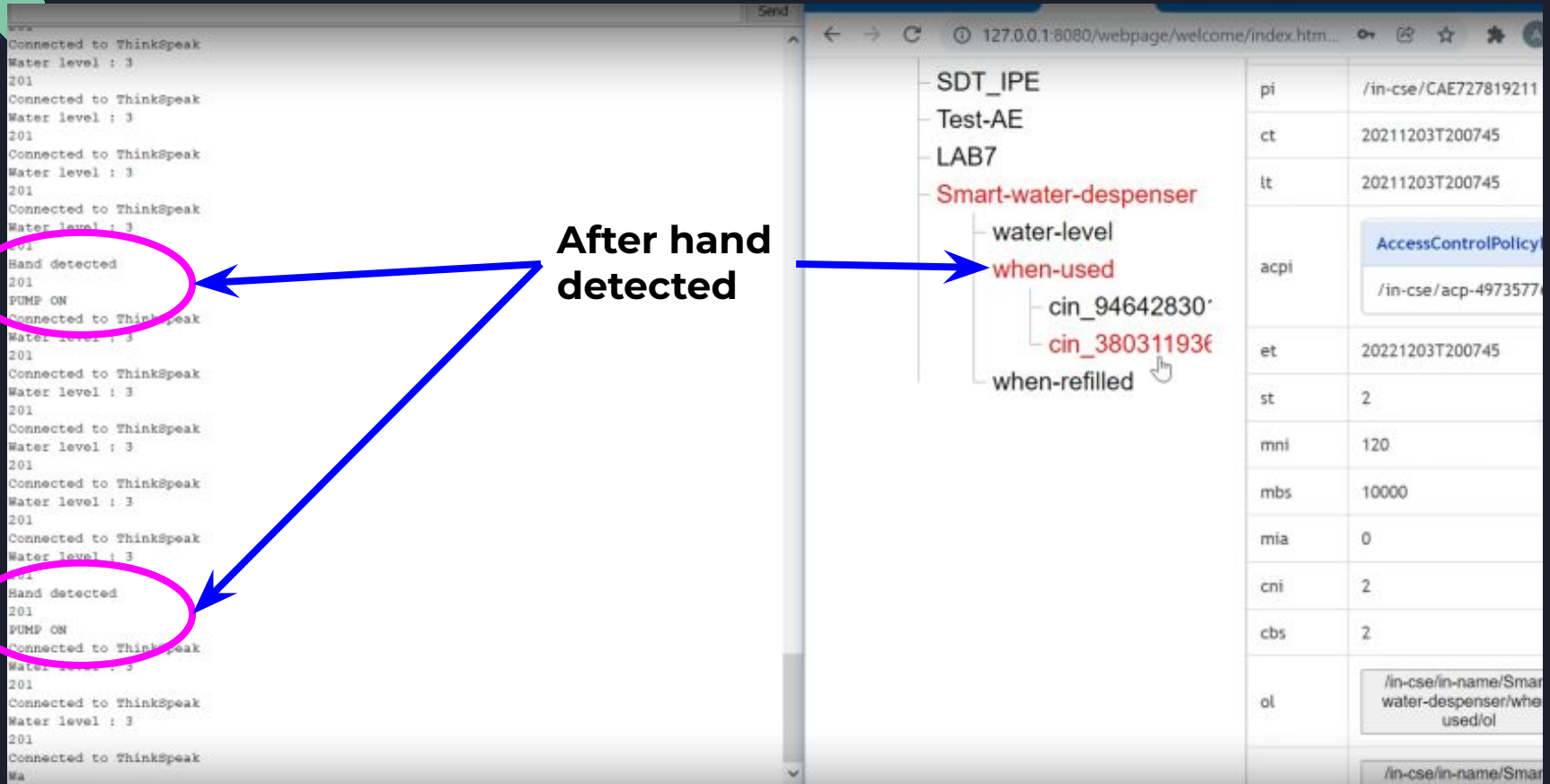


SnapShots of Project

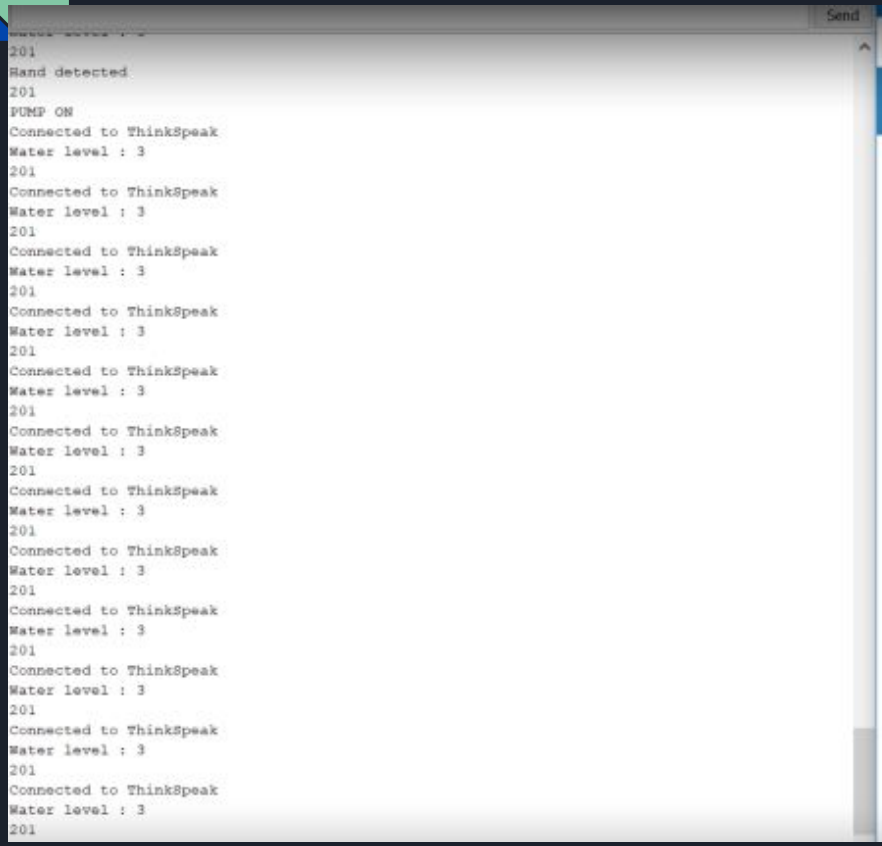
Initially Empty

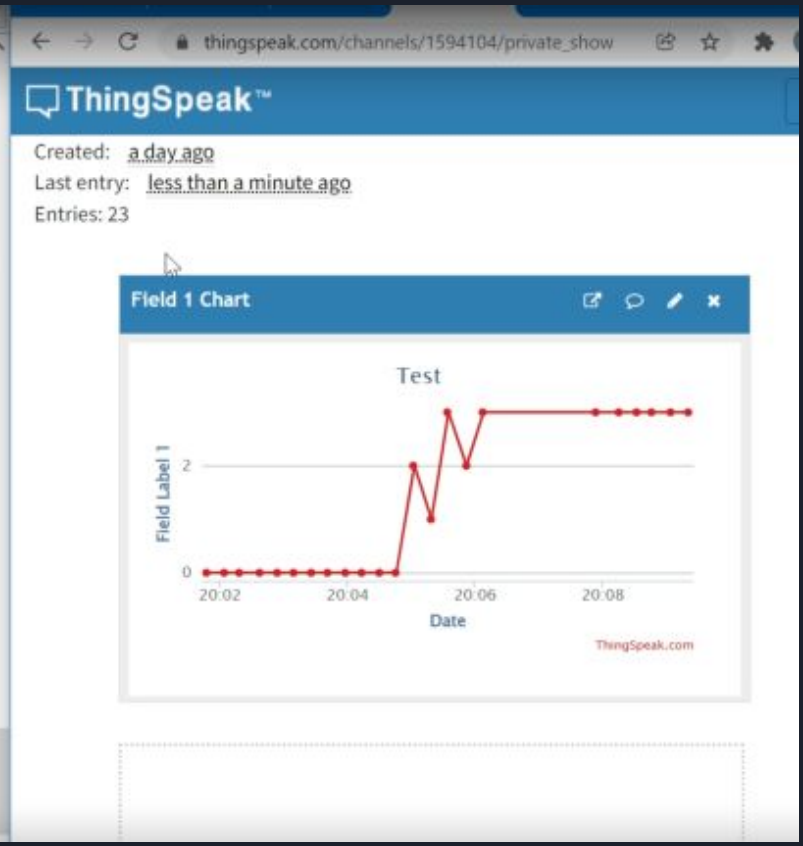


SnapShots of Project



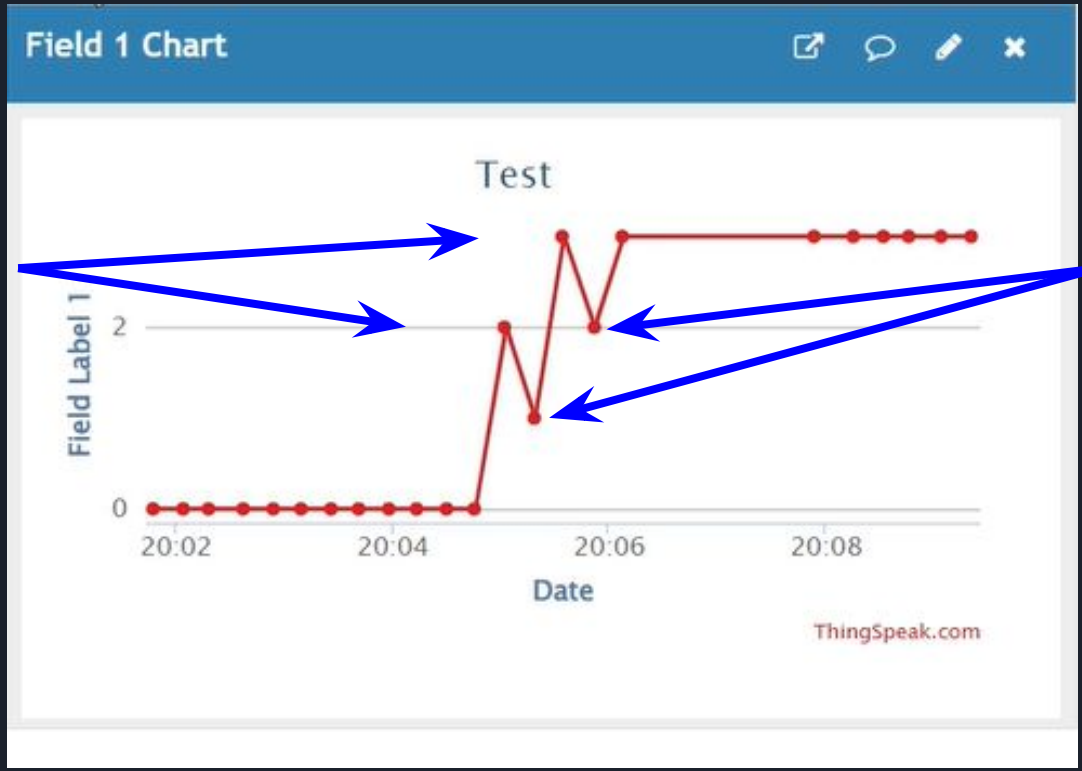
SnapShots of Project



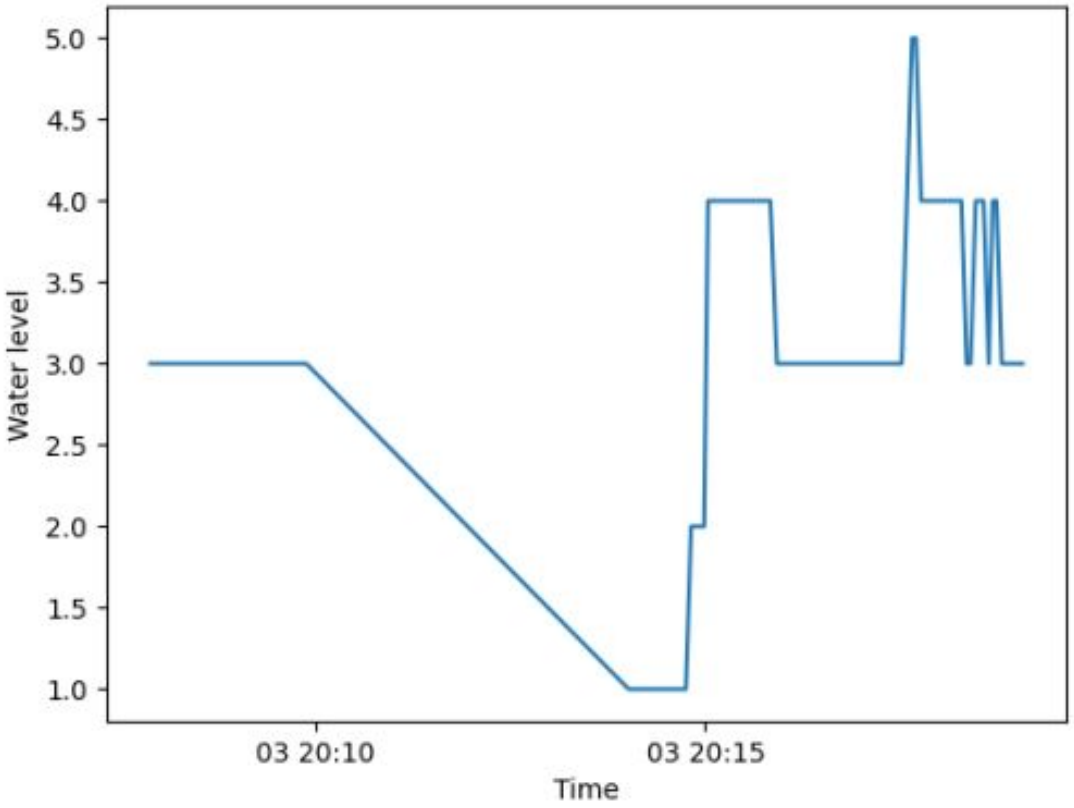


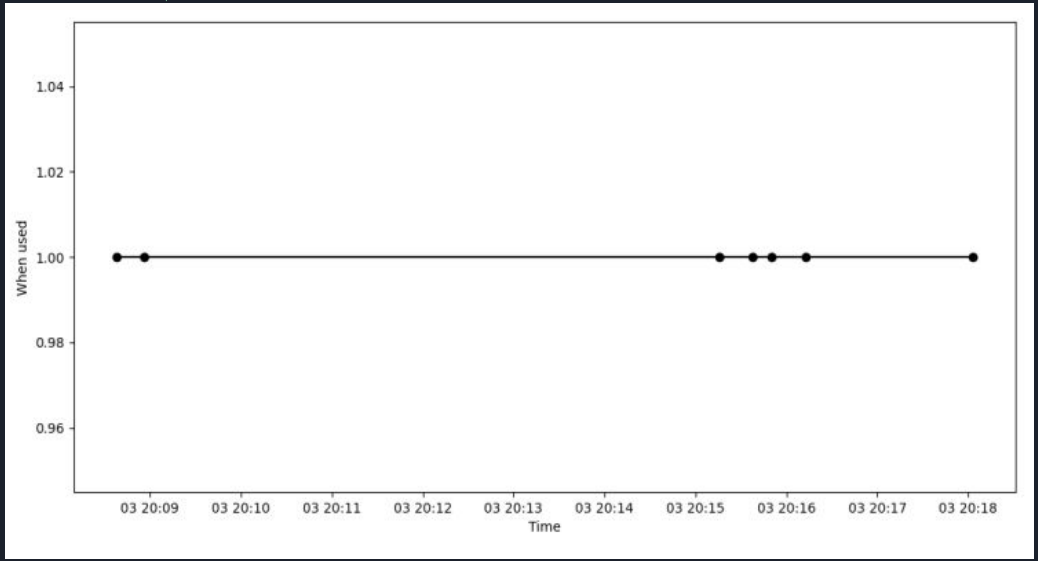
SnapShots of Project

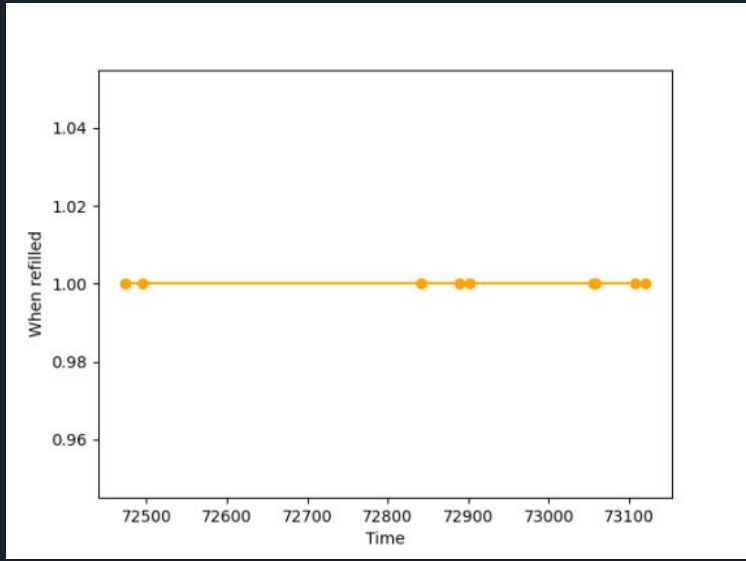
Water was poured



Hand was detected


5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
Water level
03 20:10
03 20:15
Time

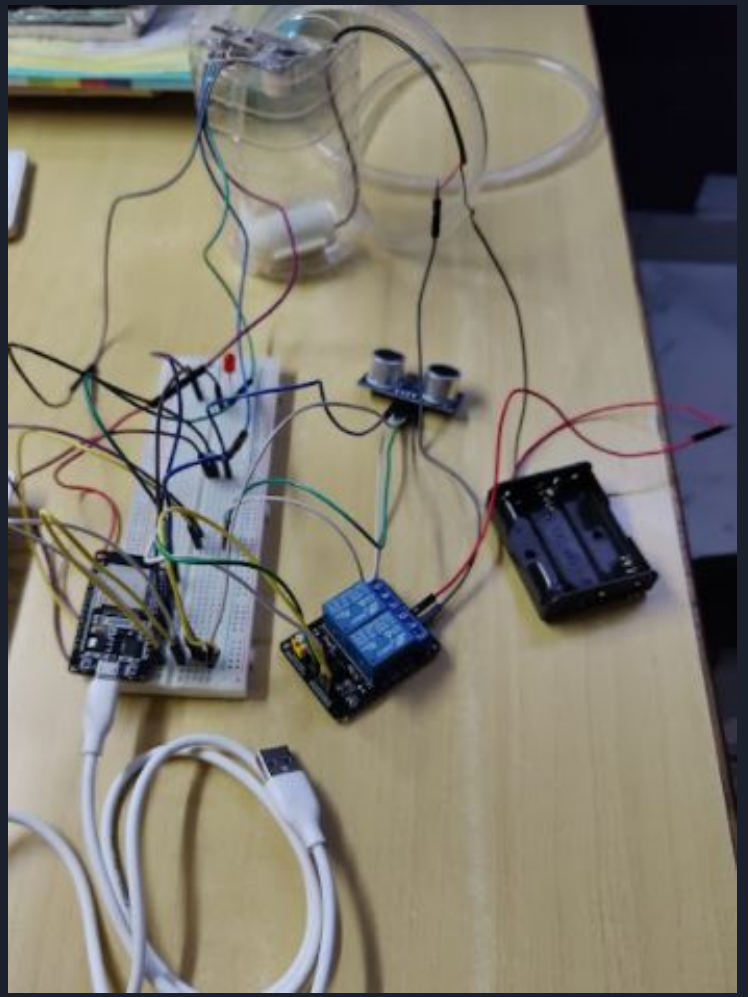

When used
1.04
1.02
1.00
0.98
0.96
03 20:09
03 20:10
03 20:11
03 20:12
03 20:13
03 20:14
03 20:15
03 20:16
03 20:17
03 20:18
Time


When refilled
1.04
1.02
1.00
0.98
0.96
72500
72600
72700
72800
72900
73000
73100
Time

Attachments

The Entire code is hosted on github : link

Some photos of design and demo video : link



Demonstration


Thank You