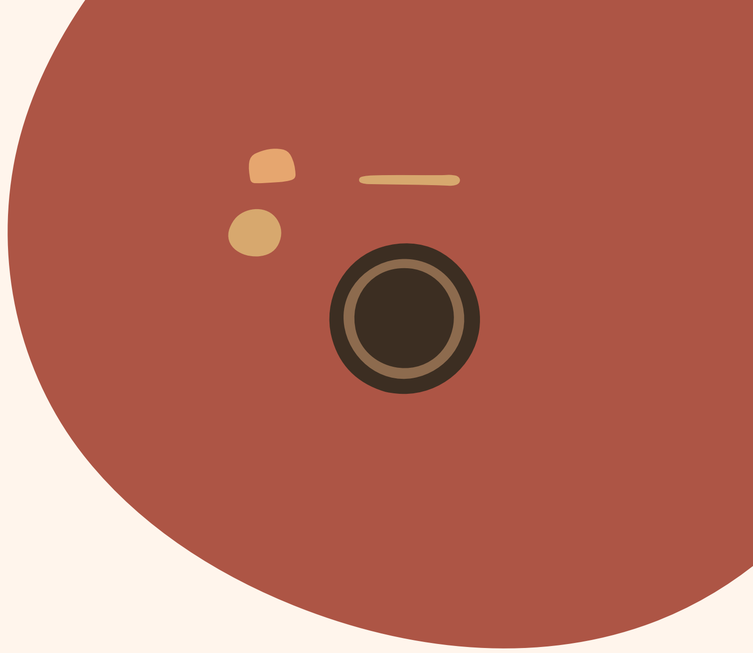
# Weather Station

Presented by Group 3 - SE1856



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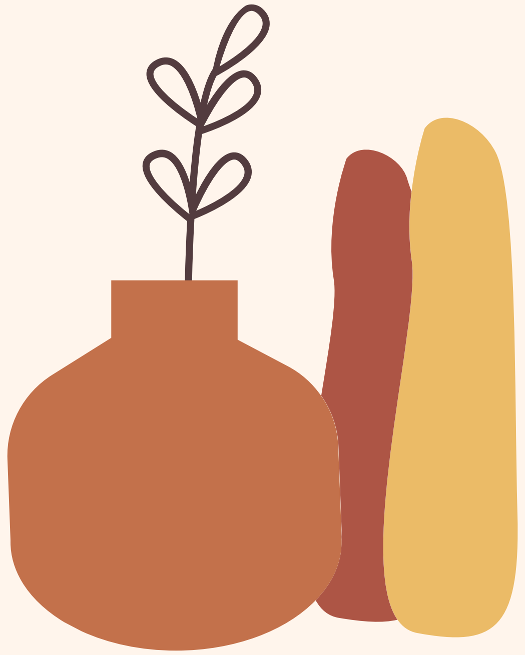


# Outline

I. INTRODUCTION

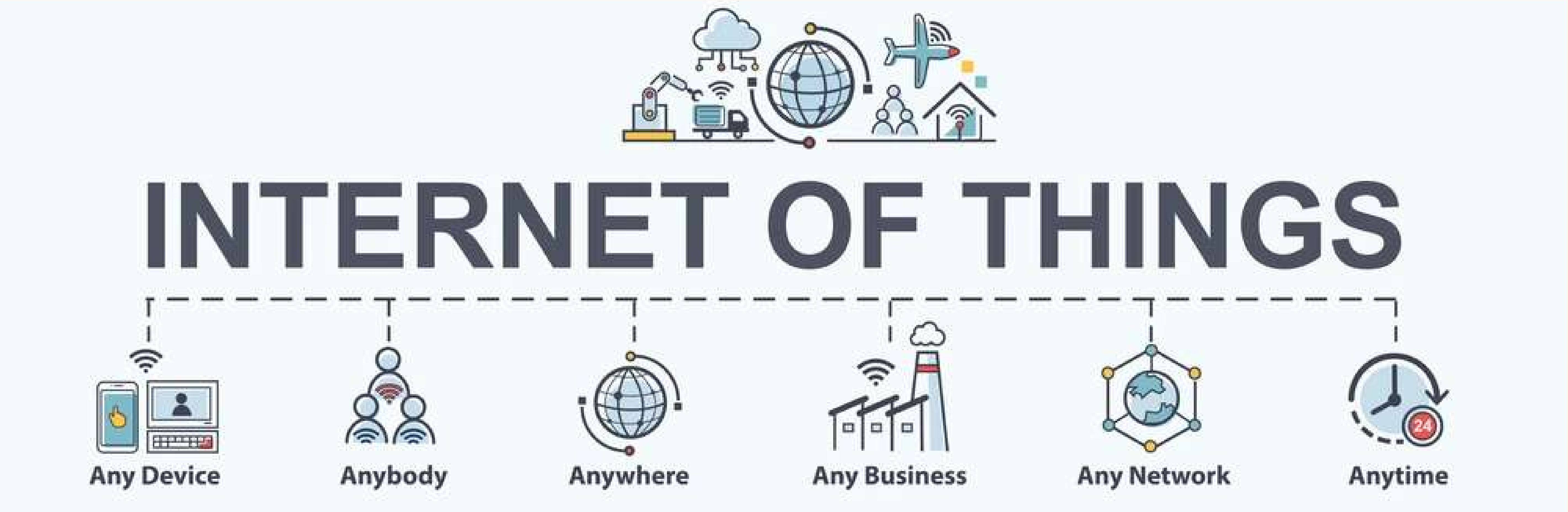
II. MAIN PROPOSAL

III. RESULTS AND DISCUSSION

IV. CONCLUSION

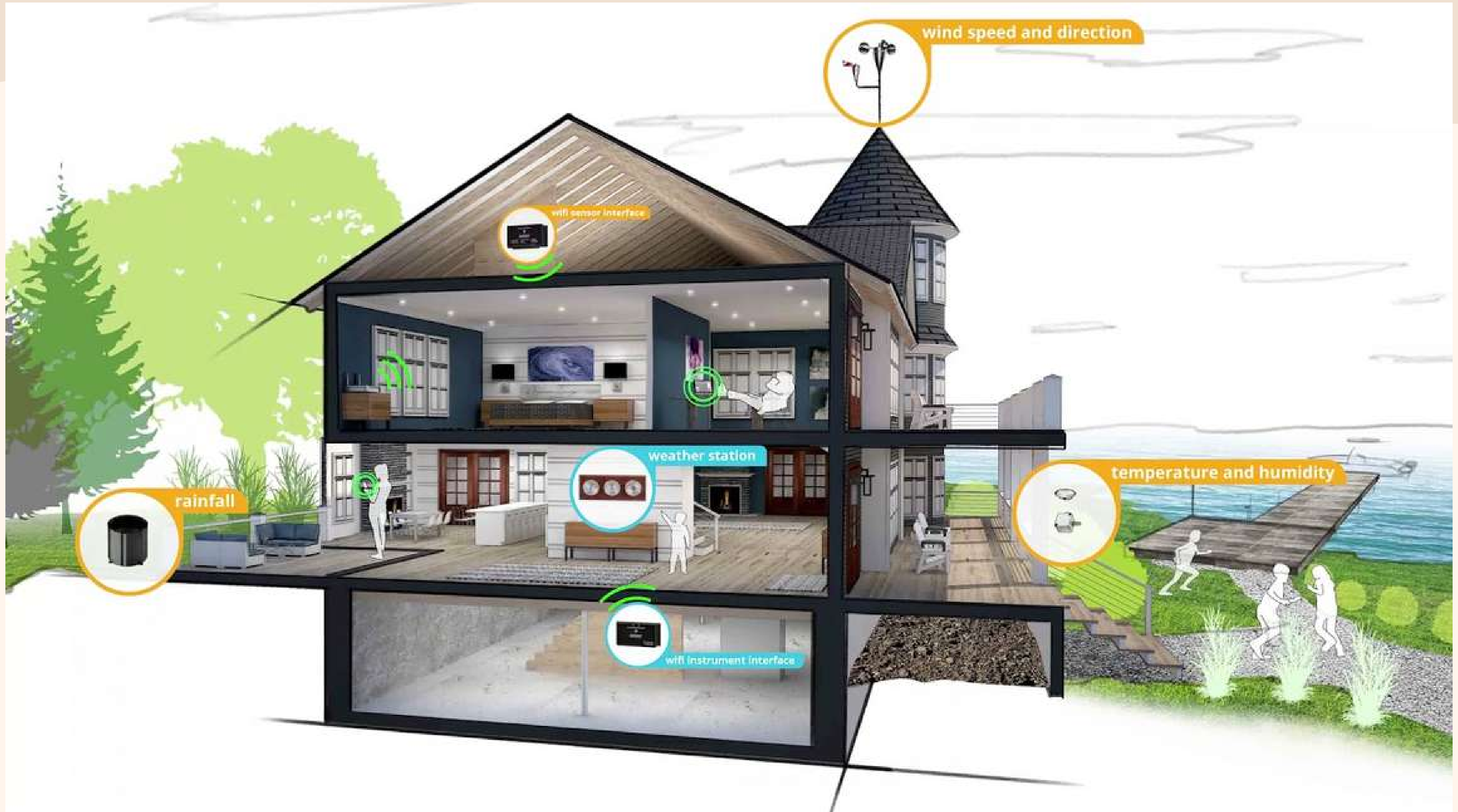
# Introduction

The global interconnectivity facilitated by high-speed Internet and IoT technology has transformative implications for various industries. IoT enables communication between humans and electronic devices, leading to advancements in transportation, energy utilization, logistics, and healthcare



# Project Goals

This project aims to develop a simple weather station using different technologies, allowing users to access real-time weather information from anywhere via an internet connection.



# MAIN PROPOSAL

A. Components and peripheral devices

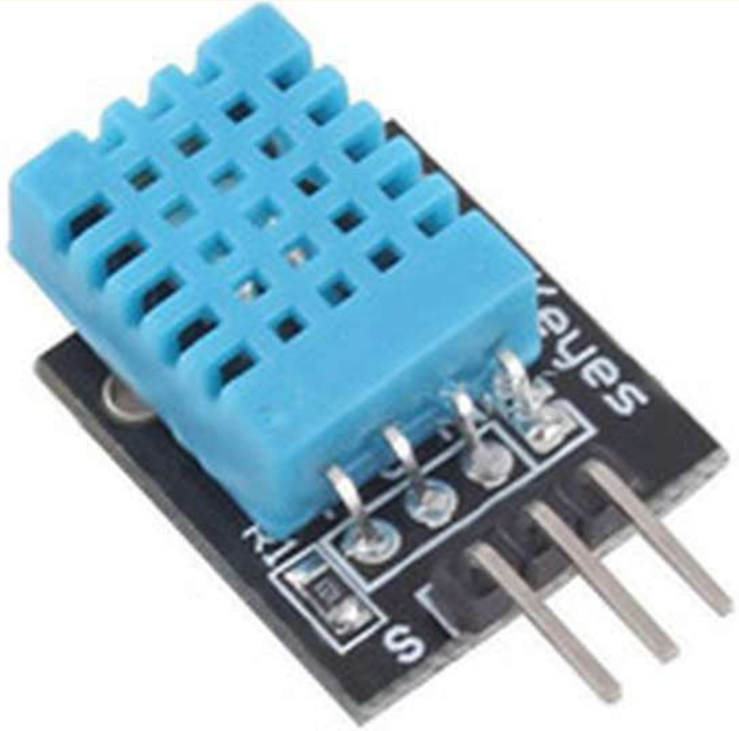
B. System models and block diagram

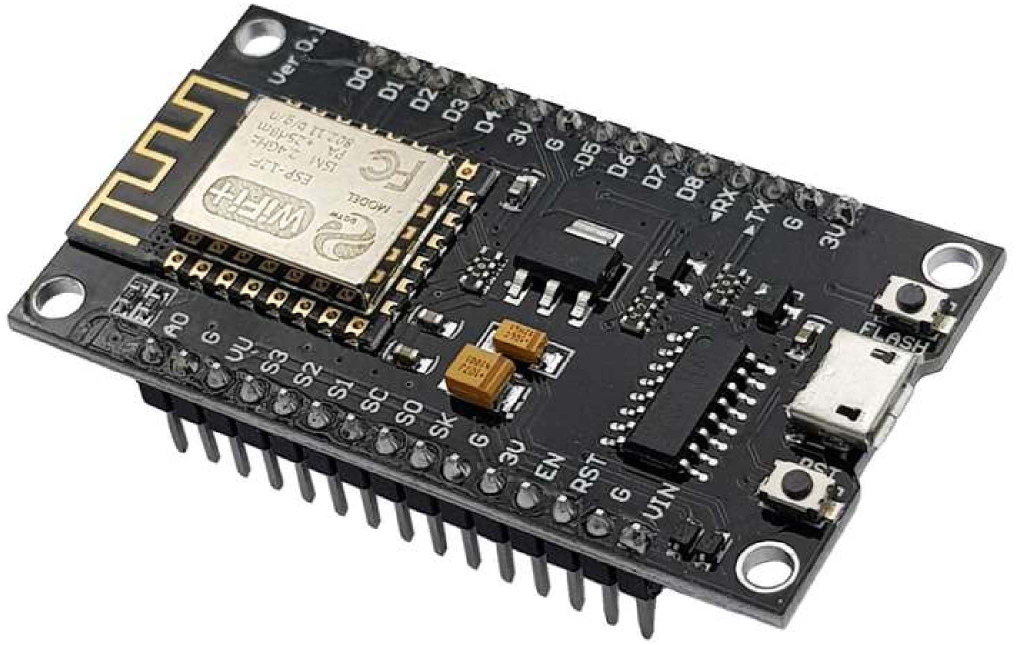
C. Programming Flowchart

D. Software programming

# A. Components and peripheral devices

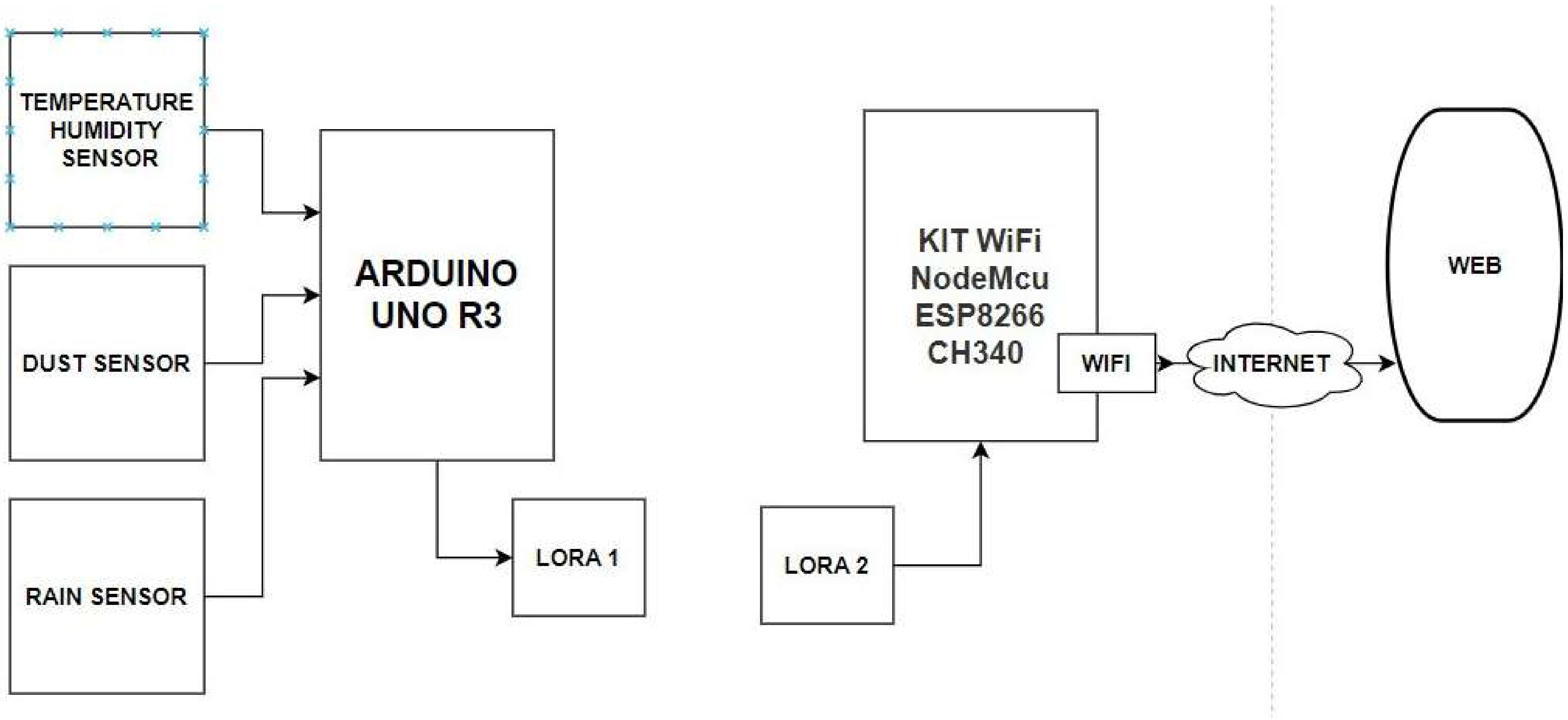
- Module Lora RF433 SX1278 RA-01 (02 modules)
- KIT WiFi NodeMcu ESP8266 CH340
- Dust sensor GP2Y1014AU PM2.5
- Temperature Humidity Sensor DHT11
- Rain Water Sensor





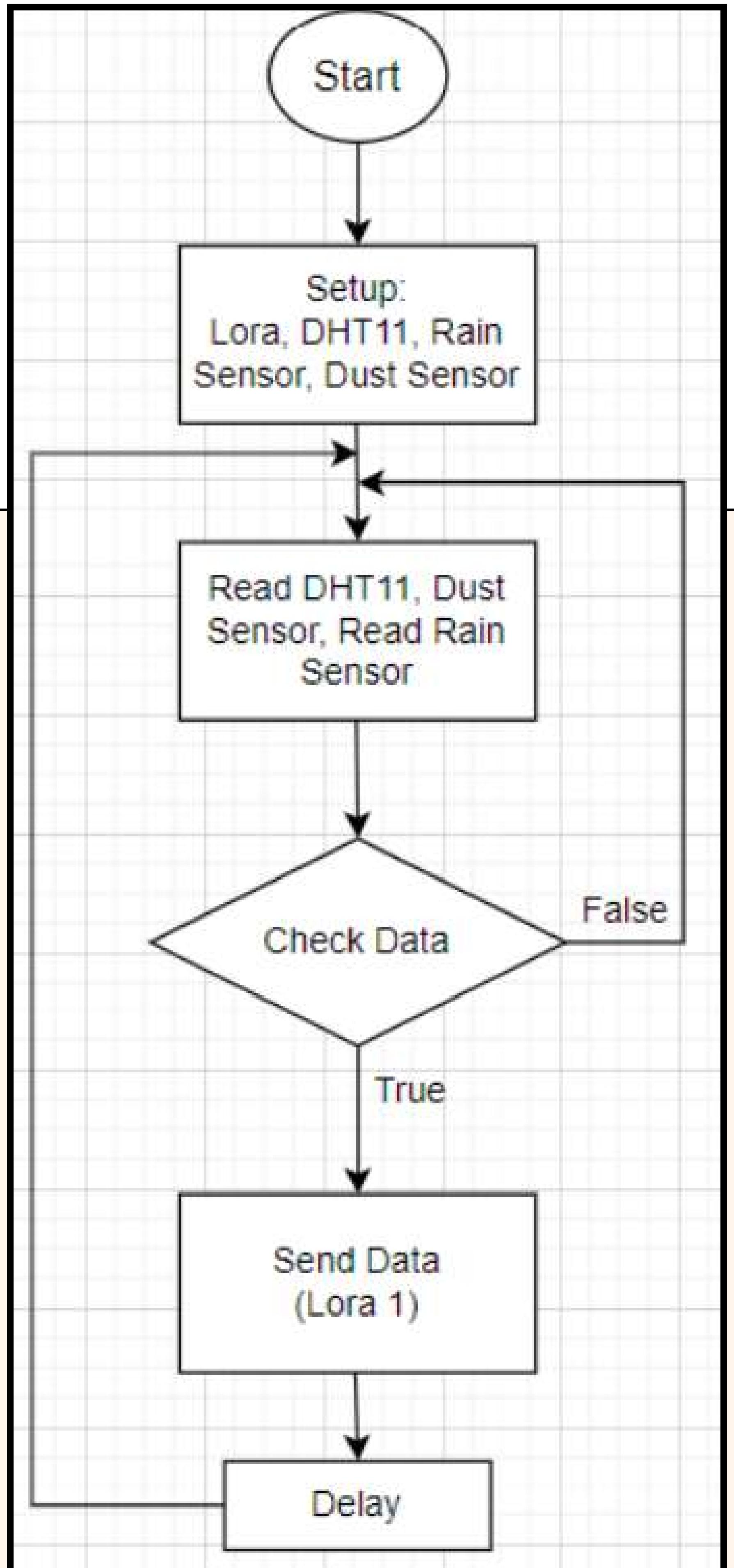
# B. System models and block diagram

## Block Diagram



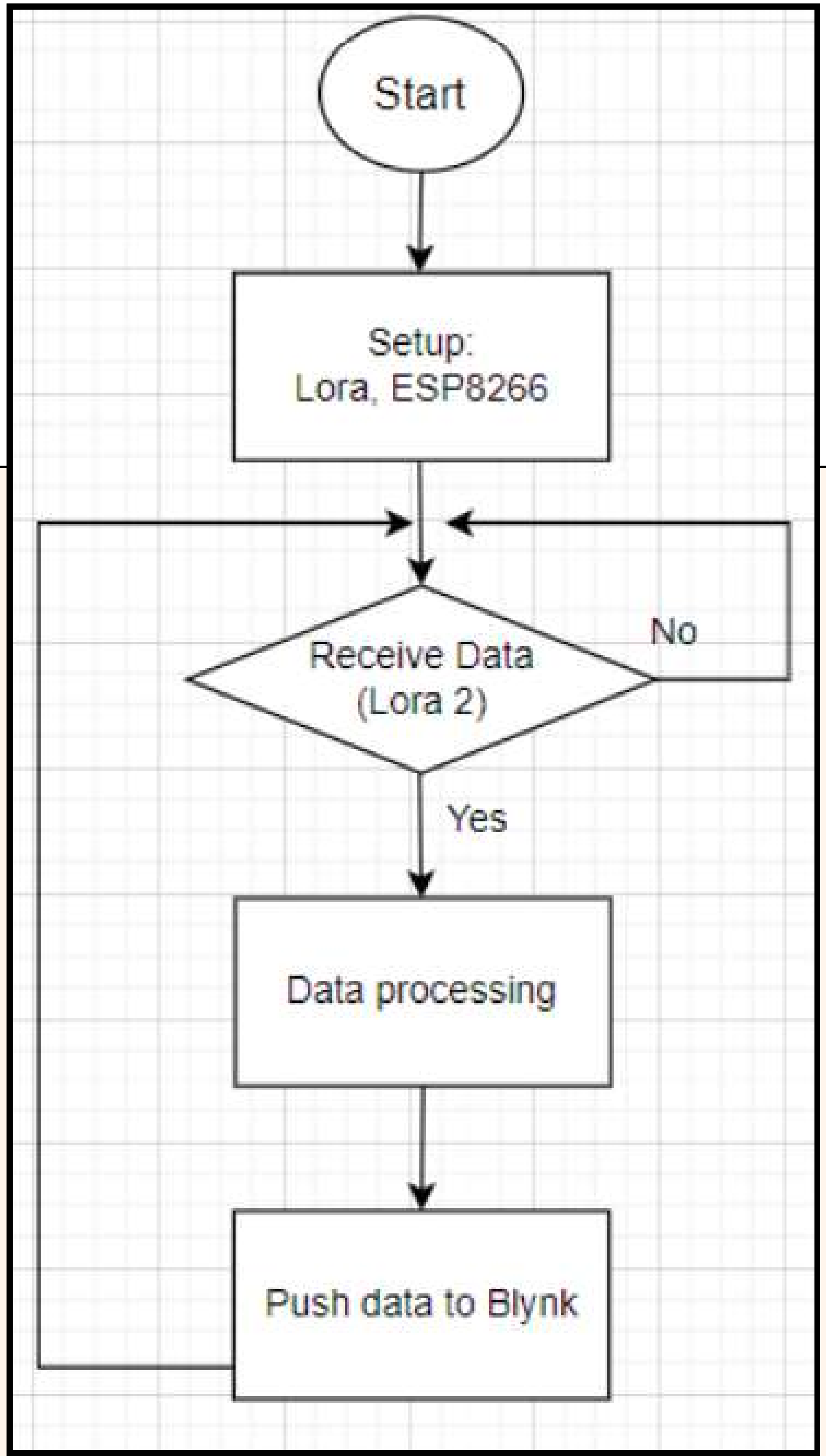
# Flowchart

## Sender



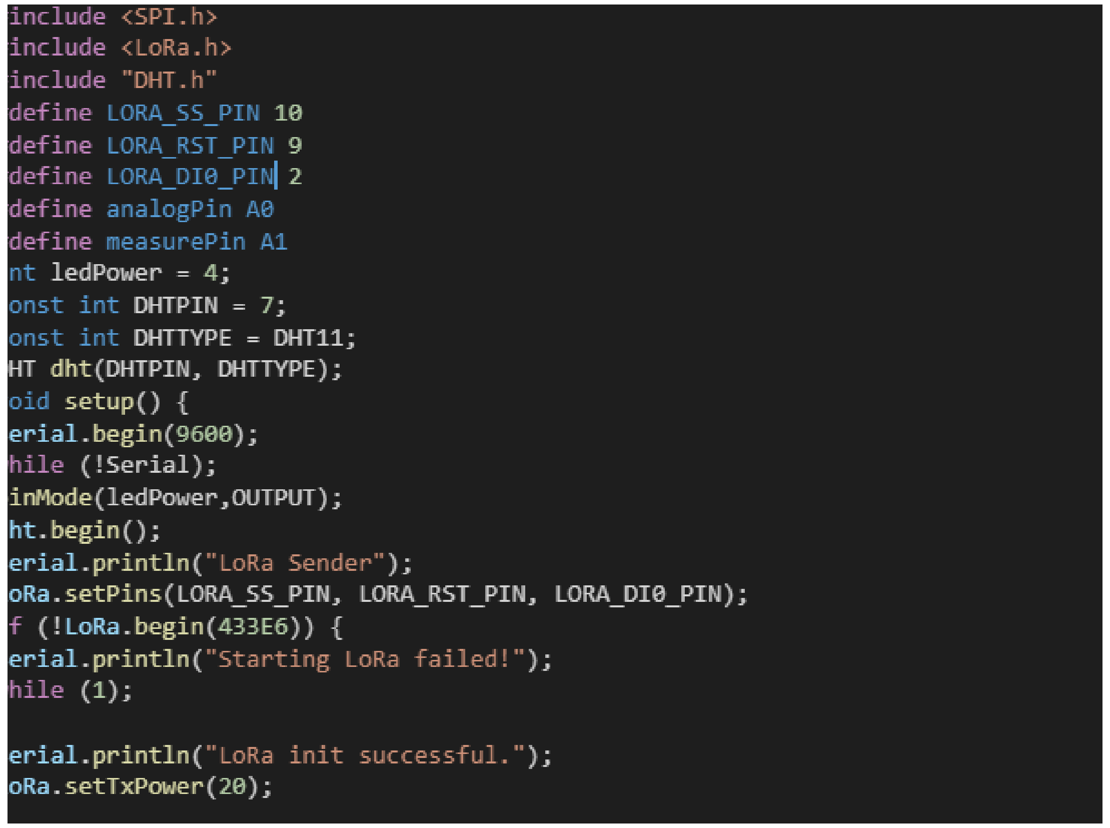
Start
Setup:
Lora, DHT11, Rain Sensor, Dust Sensor
Read DHT11, Dust Sensor, Read Rain Sensor
Check Data
False
True
Send Data (Lora 1)
Delay

## Receiver



# D. Software programming

## Sender:

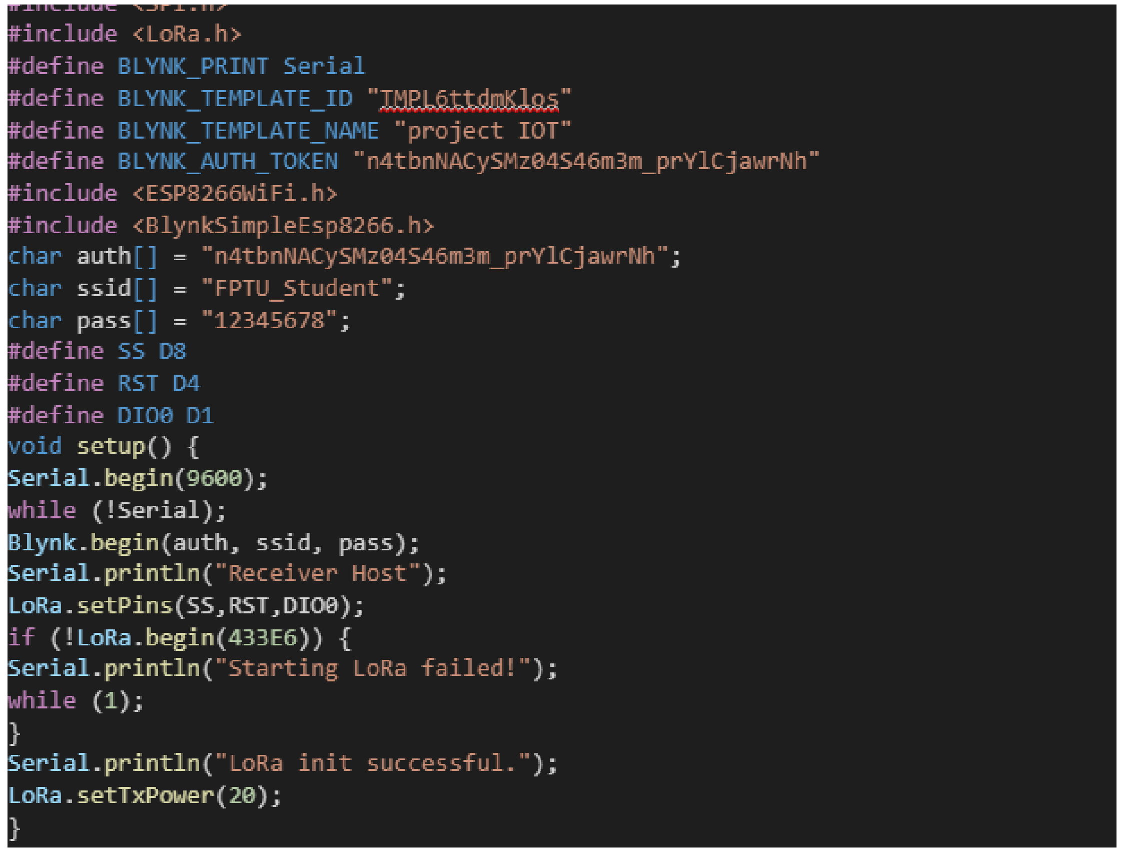


```
include <SPI.h>
include <LoRa.h>
include "DHT.h"
define LORA_SS_PIN 10
define LORA_RST_PIN 9
define LORA_DI0_PIN 2
define analogPin A0
define measurePin A1
nt ledPower = 4;
onst int DHTPIN = 7;
onst int DHTTYPE = DHT11;
HT dht(DHTPIN, DHTTYPE);
oid setup() {
erial.begin(9600);
hile (!Serial);
inMode(ledPower,OUTPUT);
ht.begin();
erial.println("LoRa Sender");
oRa.setPins(LORA_SS_PIN, LORA_RST_PIN, LORA_DI0_PIN);
f (!LoRa.begin(433E6)) {
erial.println("Starting LoRa failed!");
hile (1);

erial.println("LoRa init successful.");
oRa.setTxPower(20);
```

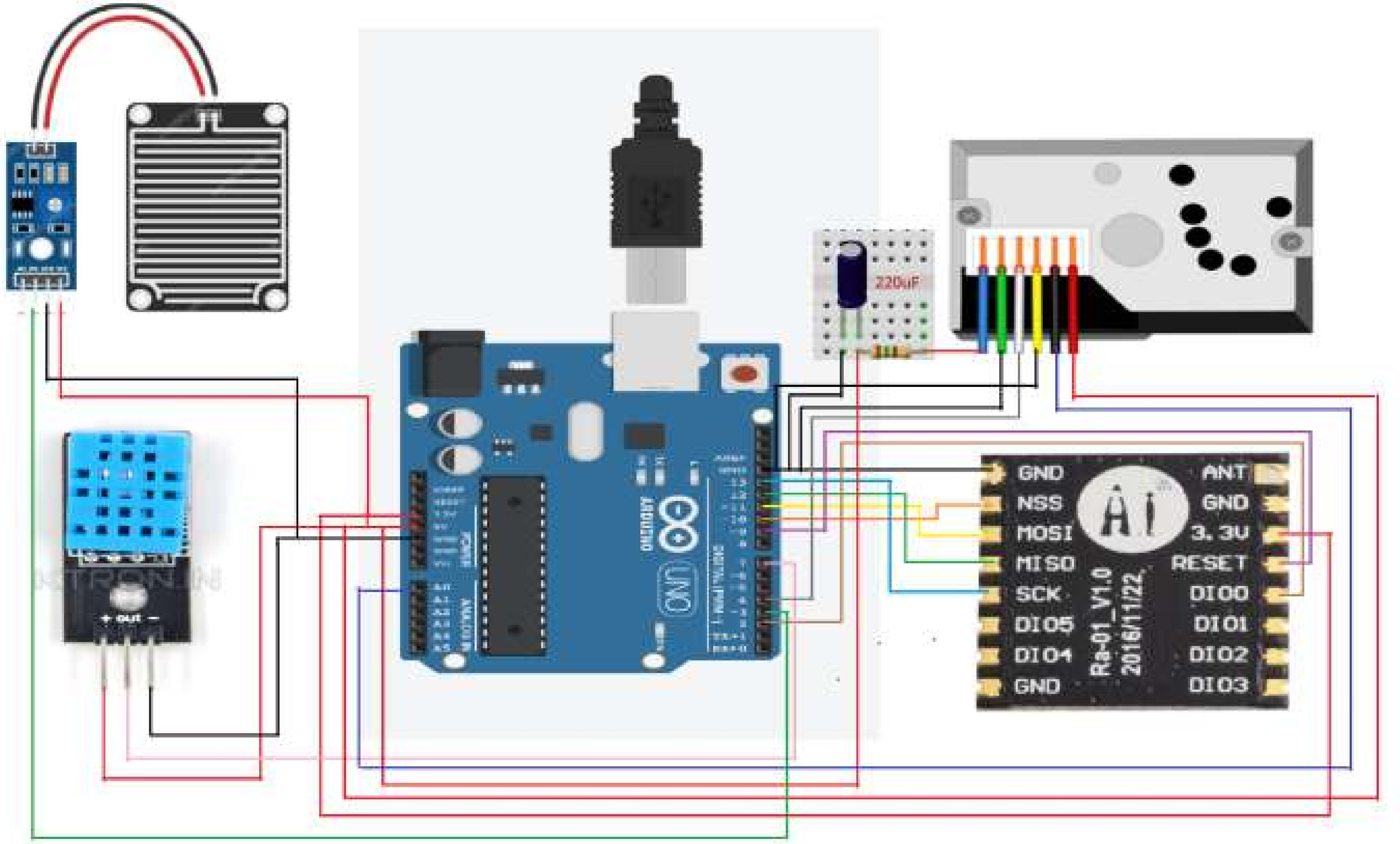
Code for Sender

## Receiver:



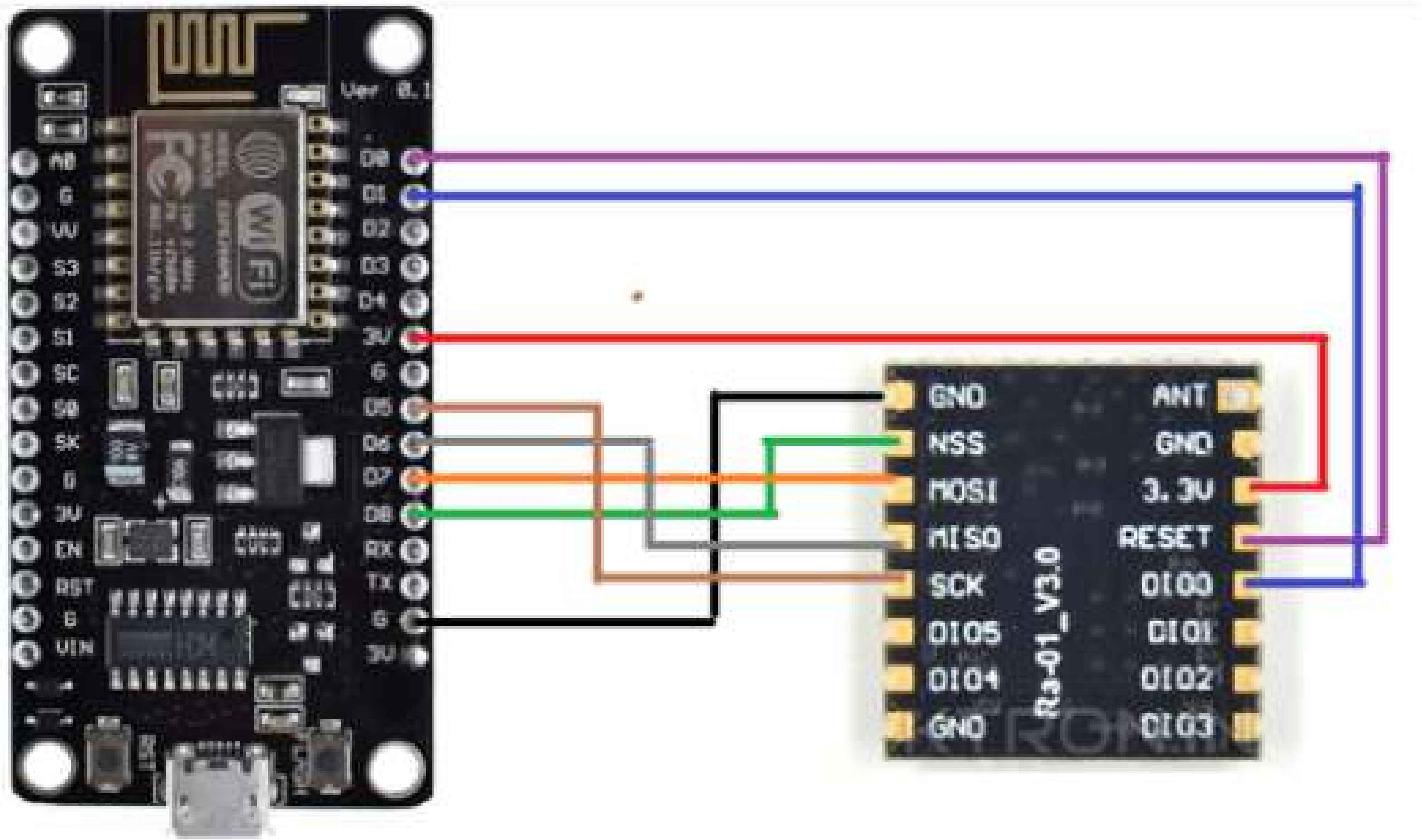
```
#include <SPI.h>
#include <LoRa.h>
#define BLYNK_PRINT Serial
#define BLYNK_TEMPLATE_ID "TMPL6ttdmKlos"
#define BLYNK_TEMPLATE_NAME "project IOT"
#define BLYNK_AUTH_TOKEN "n4tbnNACySMz04S46m3m_prYlCjawrNh"
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>
char auth[] = "n4tbnNACySMz04S46m3m_prYlCjawrNh";
char ssid[] = "FPTU_Student";
char pass[] = "12345678";
#define SS D8
#define RST D4
#define DIO0 D1
void setup() {
Serial.begin(9600);
while (!Serial);
Blynk.begin(auth, ssid, pass);
Serial.println("Receiver Host");
LoRa.setPins(SS,RST,DIO0);
if (!LoRa.begin(433E6)) {
Serial.println("Starting LoRa failed!");
while (1);
}
Serial.println("LoRa init successful.");
LoRa.setTxPower(20);
}
```

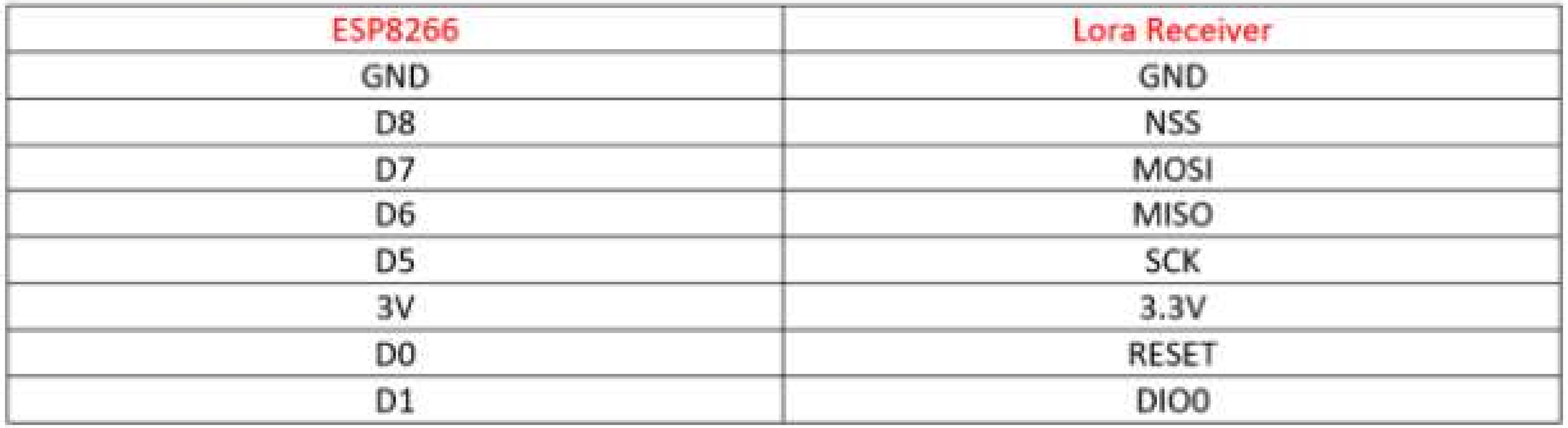
Code for Receiver



| Arduino | Lora Sender | DHT11 | Dust Sensor | Rain Water Sensor |
|---|---|---|---|---|
| GND | GND | GND | LED-GND<br>S- GND | GND |
| 10 | NSS | | | |
| 11 | MOSI | | | |
| 12 | MISO | | | |
| 13 | SCK | | | |
| 3.3V | 3.3V | | | |
| 9 | RESET | | | |
| 2 | DIO0 | | | |
| 5V | | VCC | V-LED<br>VCC | VCC |
| 7 | | DATA | | |
| 4 | | | LED | |
| A0 | | | V0 | |
| 3 | | | | D0 |

Fig. 3. Interfacing between Arduino Uno and its components (pin-to-pin)





| ESP8266 | Lora Receiver |
|---|---|
| GND | GND |
| D8 | NSS |
| D7 | MOSI |
| D6 | MISO |
| D5 | SCK |
| 3V | 3.3V |
| D0 | RESET |
| D1 | DIO0 |

Fig. 4. Interfacing between ESP8266 and its components (pin-to-pin)

# RESULTS & CONCLUSIONS

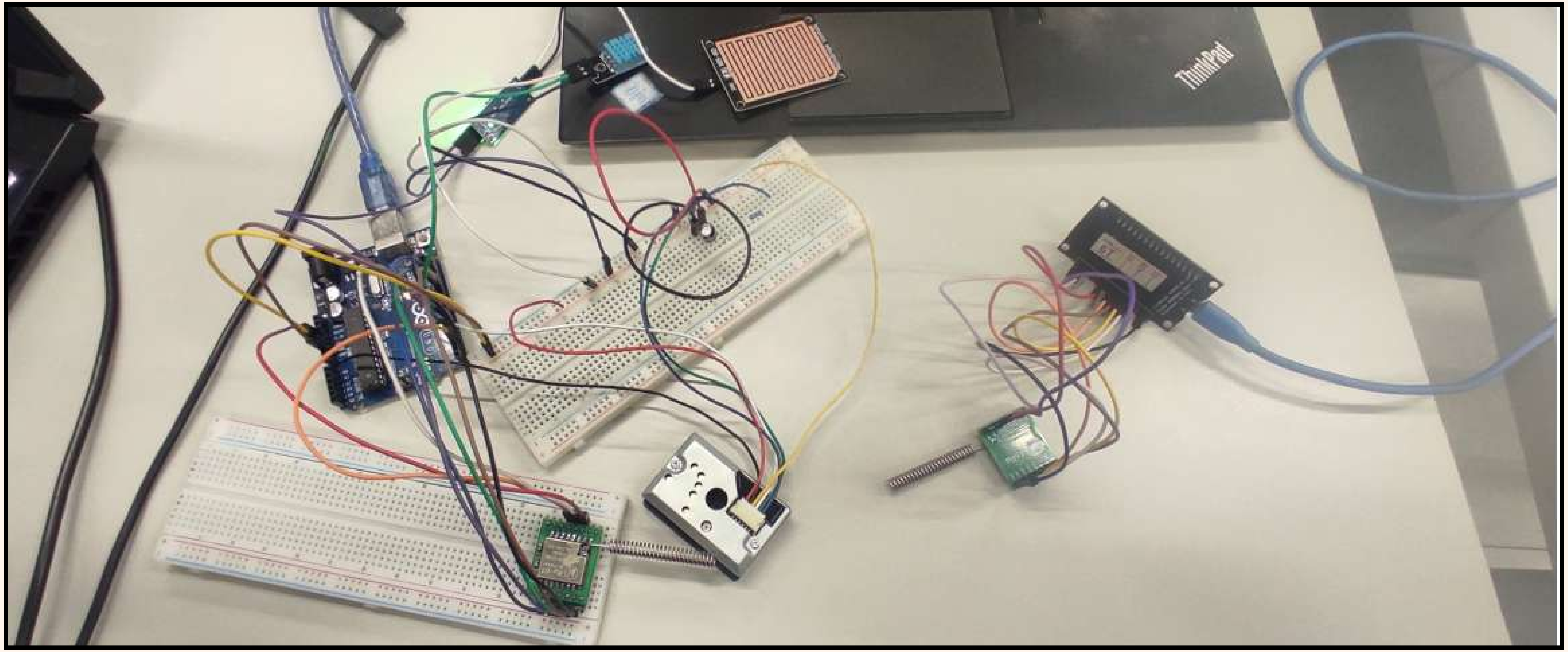
A. Prototype Implementation

B. Experimental Results

C. Conclusions & Future work

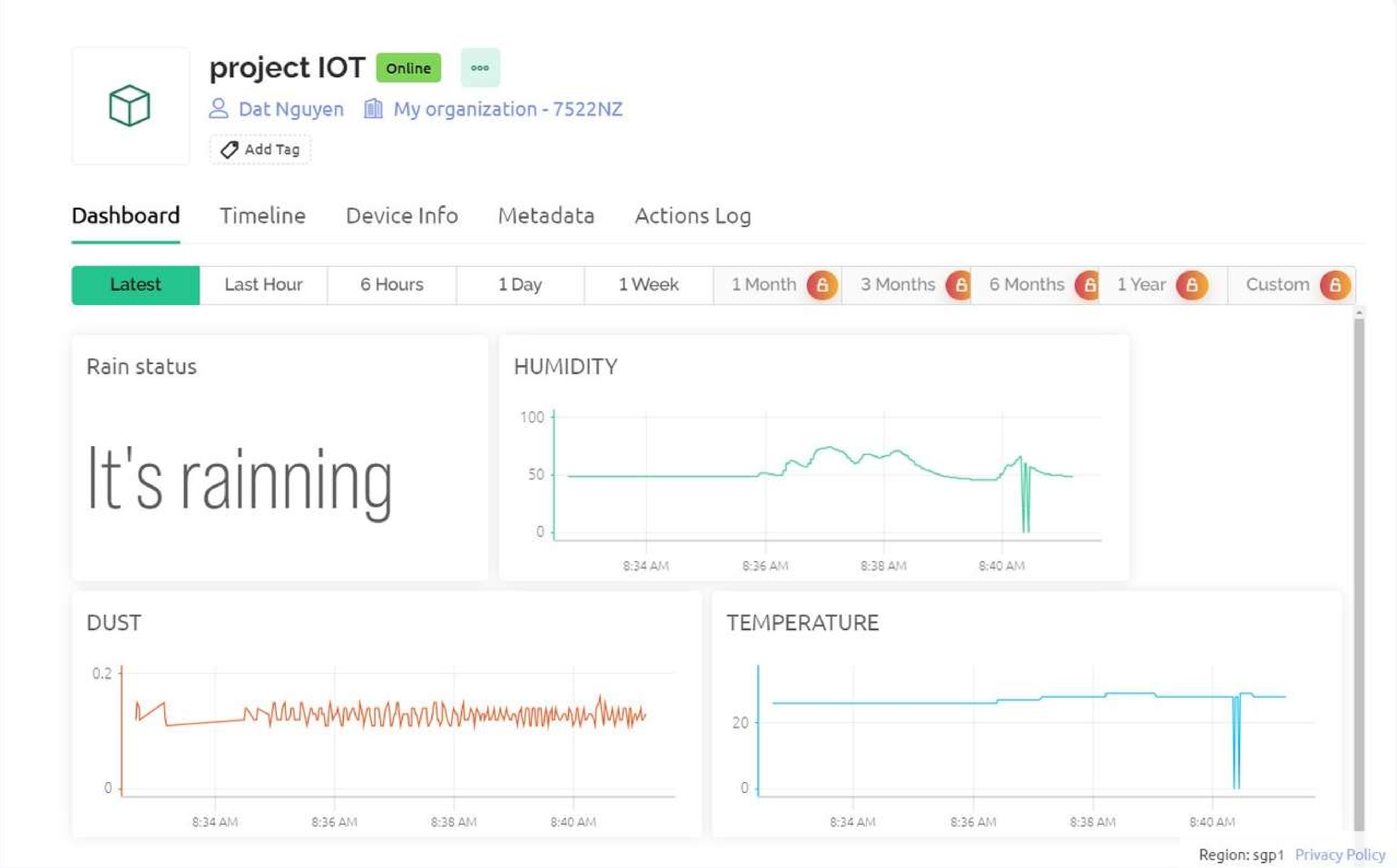
# A. Prototype Implementation

Find the necessary hardware components, including Arduino, dust sensor, temperature humidity sensor, rain water sensor, LoRa module and ESP8266.



# B. Experimental Results

Information about the sensor’s measured data is sent and displayed visually on the web. It reports temperature and humidity, rain, and dust to help us have a proper view of the weather.



project IOT Online

Dat Nguyen My organization - 7522NZ

Add Tag

Dashboard Timeline Device Info Metadata Actions Log

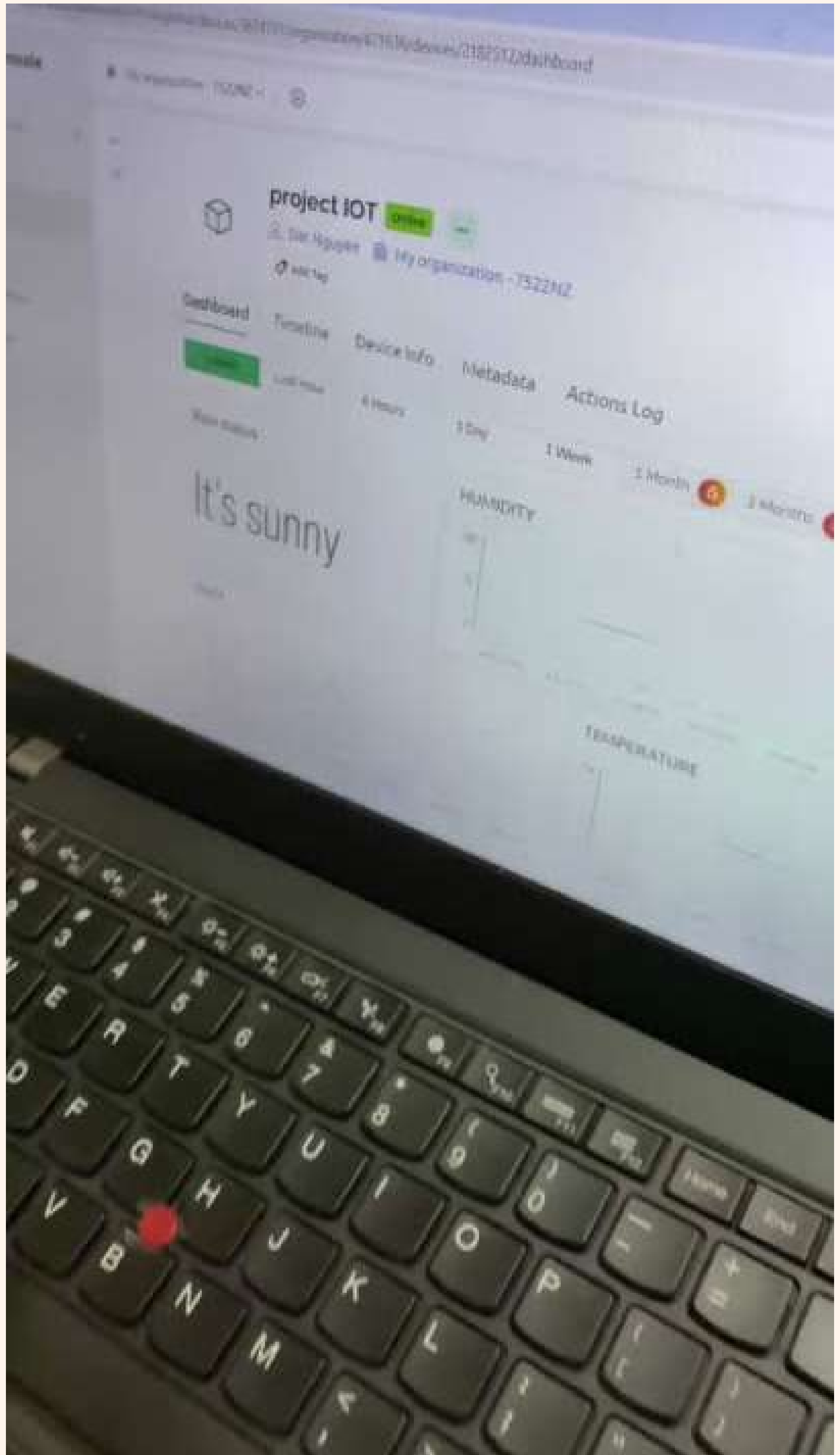
Latest | Last Hour | 6 Hours | 1 Day | 1 Week | 1 Month | 3 Months | 6 Months | 1 Year | Custom

Rain status

It's rainning

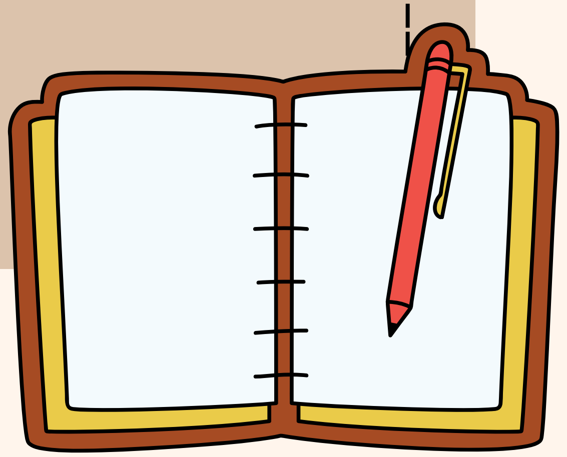
Region: sgp1 Privacy Policy

# Project Demo



# Conclusions & Future work

The IoT project aims to collect real-time environmental conditions, temperature and humidity, dust, rain using sensors and wireless communication through radio frequency modules. The collected data is then transmitted to Blynk, where it can be presented. It showcases the potential of IoT in collecting and visualizing environmental data, benefiting various applications such as agriculture and public safety.



# Question Time

# THANK YOU SO MUCH!