COAL SEMESTER PROJECT HARDWARE :

Group Members :

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- Soil Moisture Sensor
- Digital Temp & Humidity Sensor (DHT-22)
- Arduino UNO R3
- Bluetooth device HC-05
- Wires
- Power Supply 5V
- Breadboard

Breadboard

Wires

Temperature & humidity Sensor

Arduino UNO

Soil Moisture sensor

Bluetooth Device

Topic: Temperature, Humitidy and Soil Moisture Sensing Device

Introduction:

In this project we made a device which will be use to measure Temperature, Humidiy and Soil moisture using different sensors attached to the device. The sensors are connected to Arduino, which is connected to Android Application via Bluetooth.

Working :

After receiving the data from sensors, Arduino will transmit the data via Bluetooth to the Android App, then the measurements will be displayed on android app and also can be saved for later use which will be helpful for a person to analyze and store the data on the phone for future use. We will use C++ programming language to program the Arduino.

Objective:

To see the interfacing between hardware and software components, and to analyze about how the data transmition works between software and hardware or how the software/ hardware boundry is crossed for better understanding of hardware.

Uses:

Farmers can use this device in the field to check if the environment is perfect for a certain crops or not. If not he can take quick measures to save the crops, or else he can plant different crops which is suitable to the environment. A simple walk around the field with an android device can connect the application with the device via bluetooth, due to which data will be collected immediately. Moreover, this device will not only help to check the crops but will also provide financial benefits i.e saving crops will automatically save money. Furthermore, tree plantation process can also take advantage of this device to check whether the current environment is proper to plant certain tree species or not.

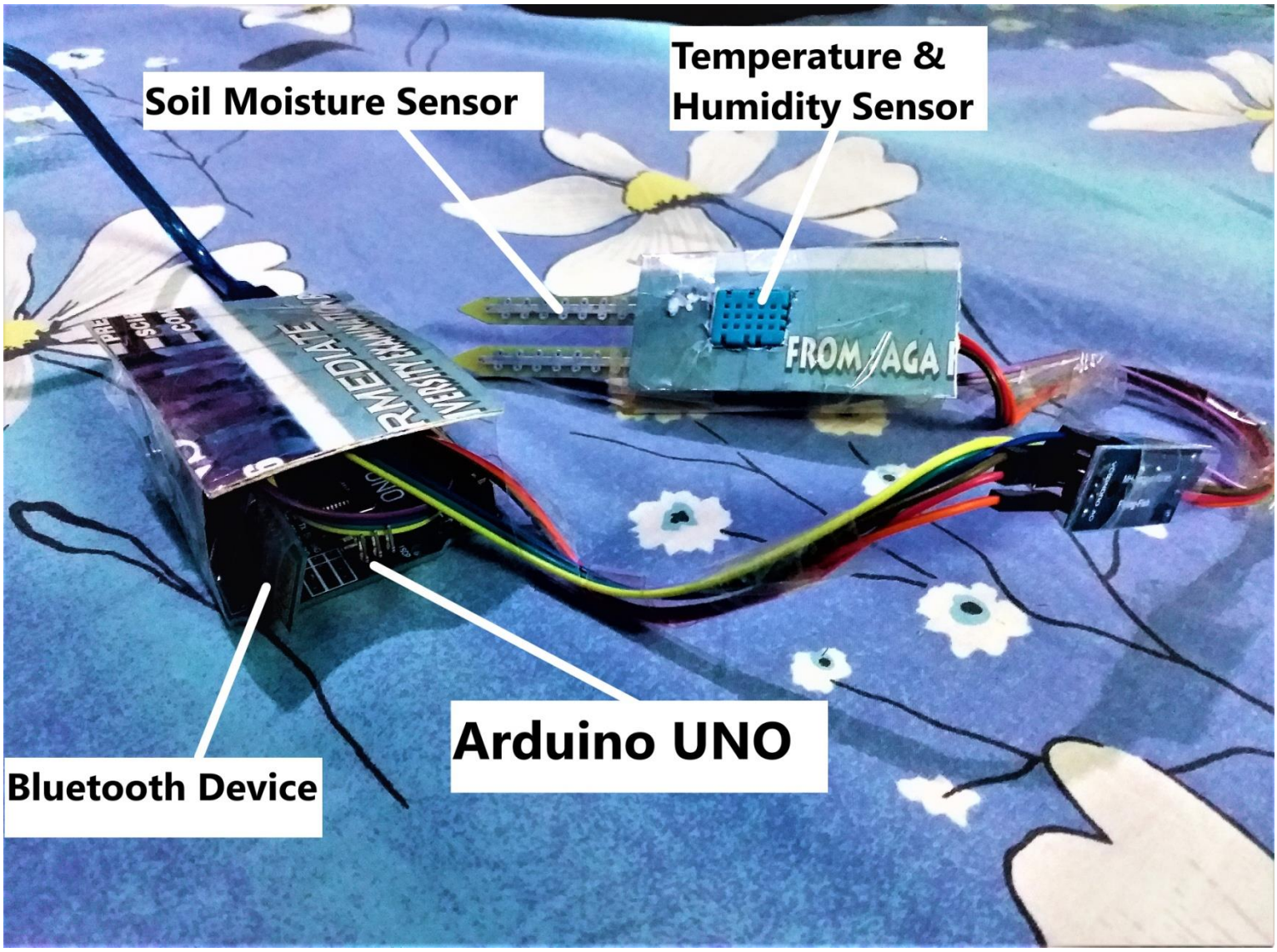
Components with Cost:

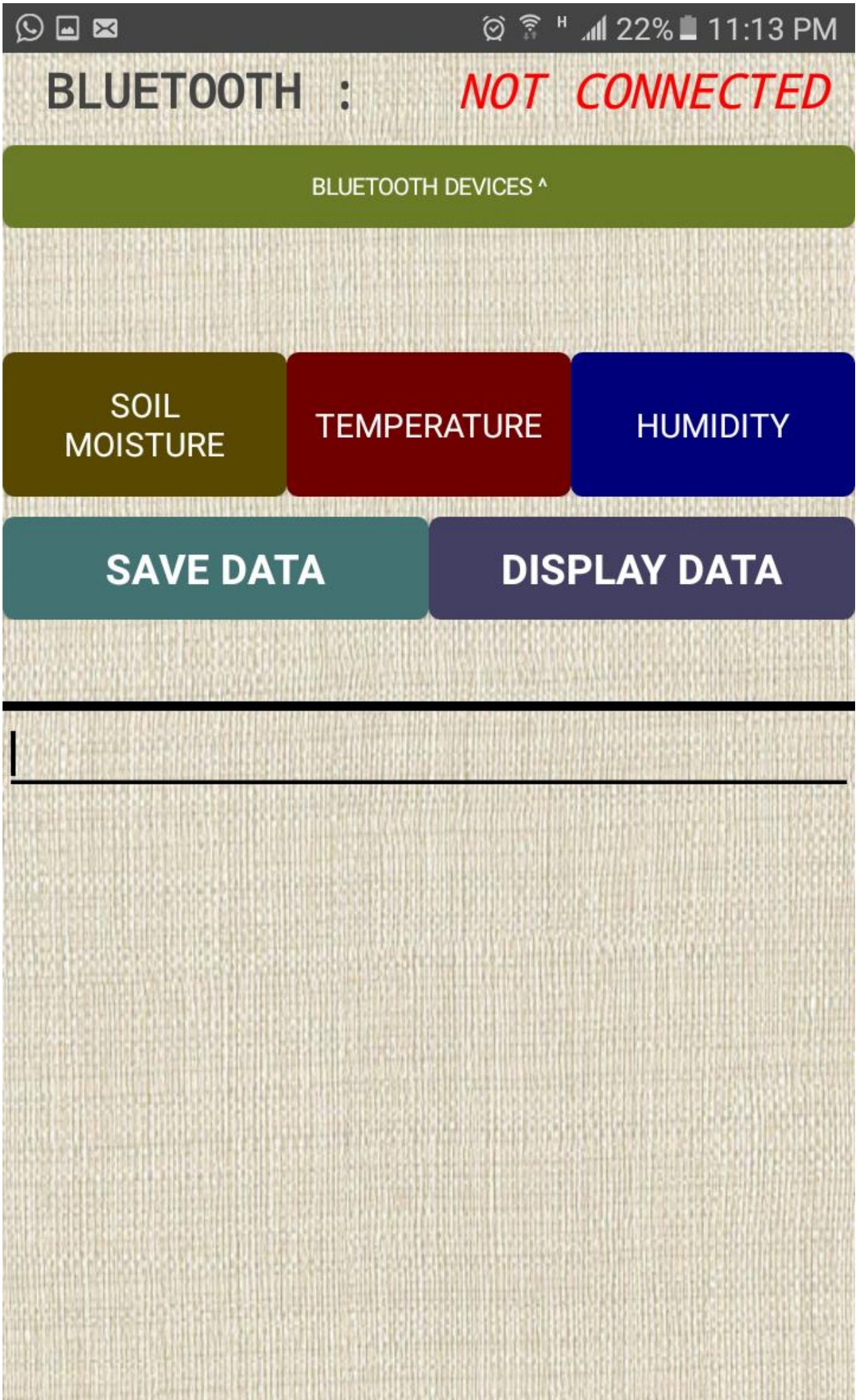
-Digital Temp & Humidity Sensor (DHT-22) : 650rs
-Soil Moisture Sensor : 350rs
-Arduino UNO R3 : 570rs
-Bluetooth Device HC-05 : 500rs
-Android App : free
-Breadboard : 150rs
-Batteries : 100rs
-Storage Device : free
-Wires : 140rs

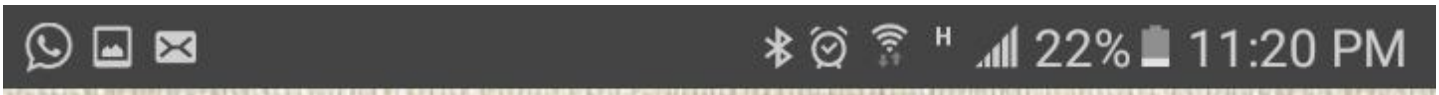
Total Cost Approx. = 2200rs

ARDUINO CODE

```
#include <SoftwareSerial.h>
#include "dht.h"
#define dht_apin A0                          // connected to dht temp and humidity
SoftwareSerial bluetooth(10,11);                 // rx | tx // rx at 10 and tx at 11
int sensor_pin = A1;                         // soil moisture pin
int output_value ;
byte inchar;              // inout from device to bluetooth
dht DHT;                // object to read temp and humidity sensor data
void setup()
{
  Serial.begin(9600);
  bluetooth.begin(9600);
  delay(1000);
}
void loop()
{
  if(bluetooth.available() >0)
  {
    DHT.read11(dht_apin);
    inchar=bluetooth.read();               // read from device
    if(inchar=='1')
    {
      output_value= analogRead(sensor_pin);
      output_value = map(output_value,550,0,0,100);
      Serial.print("Mositure : ");
      Serial.println(output_value);
      Serial.println("%");
      bluetooth.println(output_value);               // send output value or soil moisture value
    }
    else if(inchar=='2')
    {
      Serial.print("temperature = ");
      Serial.println(DHT.temperature);
      Serial.println("C  ");
      bluetooth.println(DHT.temperature);              // send temperature value
    }
    else if(inchar=='3')
    {
      Serial.print("Current humidity = ");
      Serial.println(DHT.humidity);
      Serial.print("%  ");
      bluetooth.println(DHT.humidity);               // send humdity value
    }
  }
  delay(1000);
}
```


Soil Moisture Sensor
Temperature &
Humidity Sensor
Arduino UNO
Bluetooth Device


22% 11:13 PM
BLUETOOTH : NOT CONNECTED
BLUETOOTH DEVICES ^
SOIL MOISTURE
TEMPERATURE
HUMIDITY
SAVE DATA
DISPLAY DATA



BLUETOOTH : CONNECTED

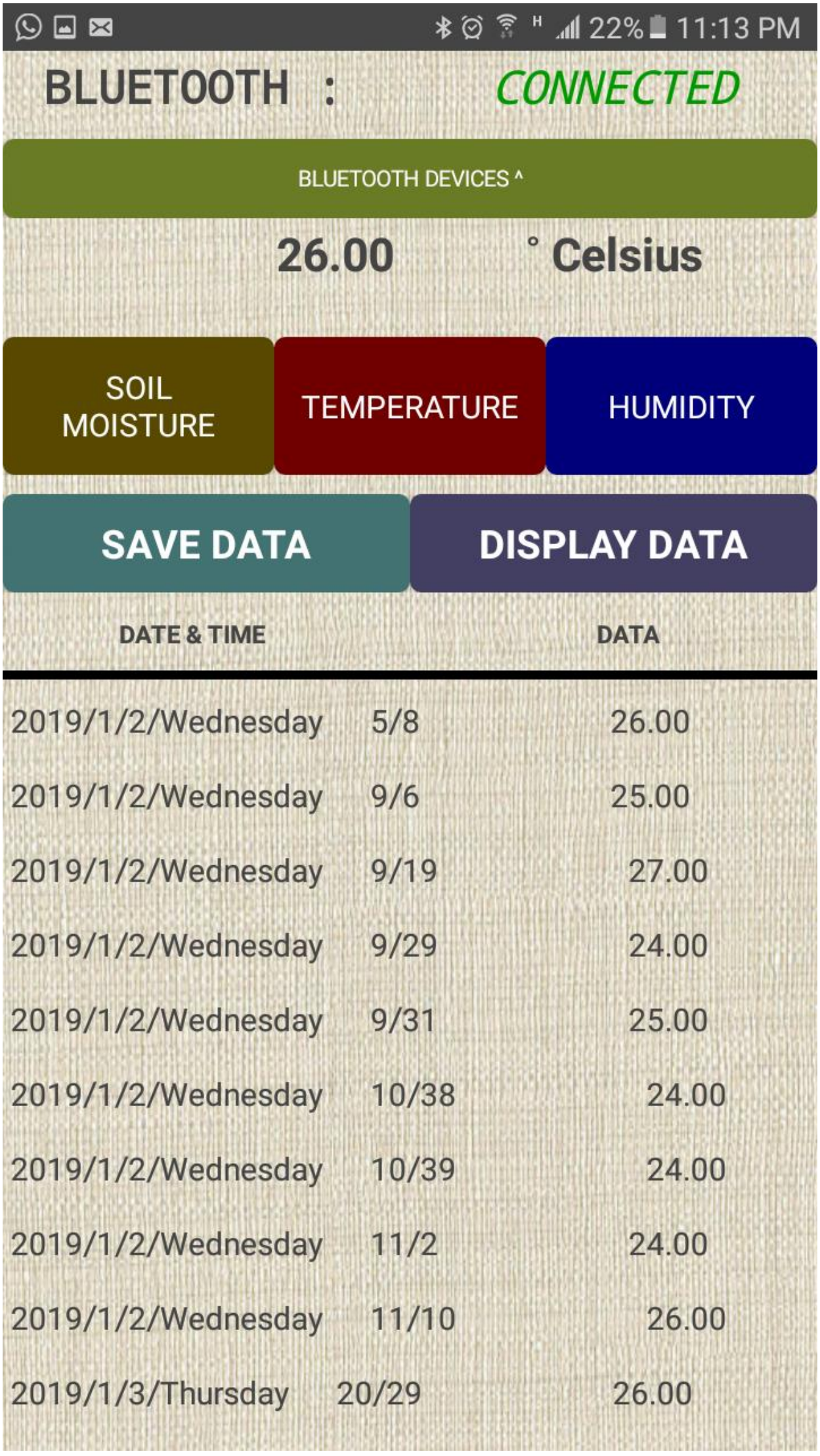
BLUETOOTH DEVICES ^

36 % moisture

SOIL MOISTURE | TEMPERATURE | HUMIDITY

SAVE DATA | DISPLAY DATA

DATE & TIME		DATA
2019/1/2/Wednesday	11/2	-19
2019/1/2/Wednesday	11/10	28
2019/1/3/Thursday	20/29	-19
2019/1/3/Thursday	23/13	-15
2019/1/3/Thursday	23/14	-15
2019/1/3/Thursday	23/20	36


22% 11:13 PM
BLUETOOTH : CONNECTED
BLUETOOTH DEVICES ^
26.00 ° Celsius
SOIL MOISTURE
TEMPERATURE
HUMIDITY
SAVE DATA
DISPLAY DATA
DATE & TIME
DATA
2019/1/2/Wednesday 5/8 26.00
2019/1/2/Wednesday 9/6 25.00
2019/1/2/Wednesday 9/19 27.00
2019/1/2/Wednesday 9/29 24.00
2019/1/2/Wednesday 9/31 25.00
2019/1/2/Wednesday 10/38 24.00
2019/1/2/Wednesday 10/39 24.00
2019/1/2/Wednesday 11/2 24.00
2019/1/2/Wednesday 11/10 26.00
2019/1/3/Thursday 20/29 26.00

BLUETOOTH : CONNECTED

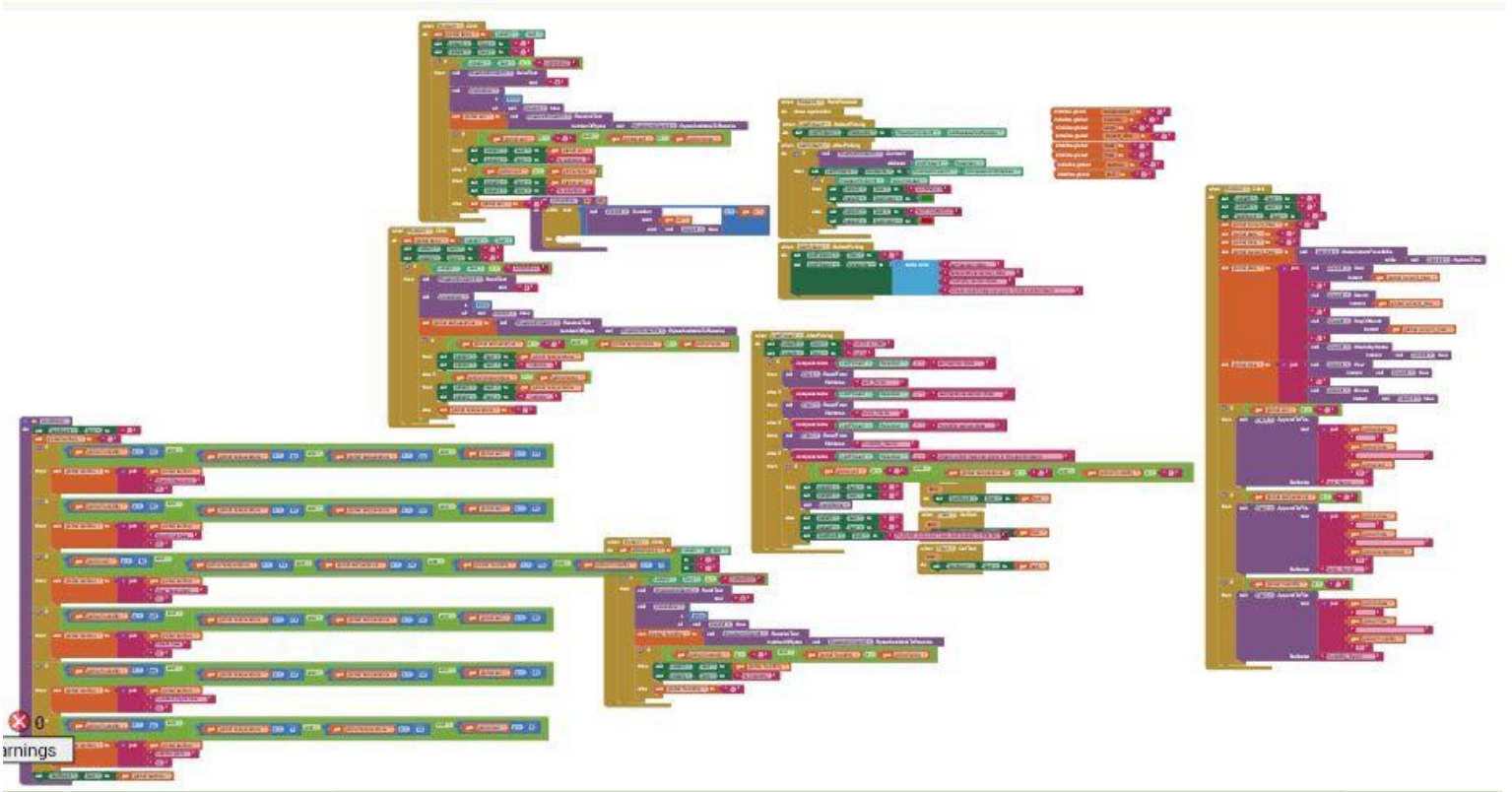
BLUETOOTH DEVICES ^

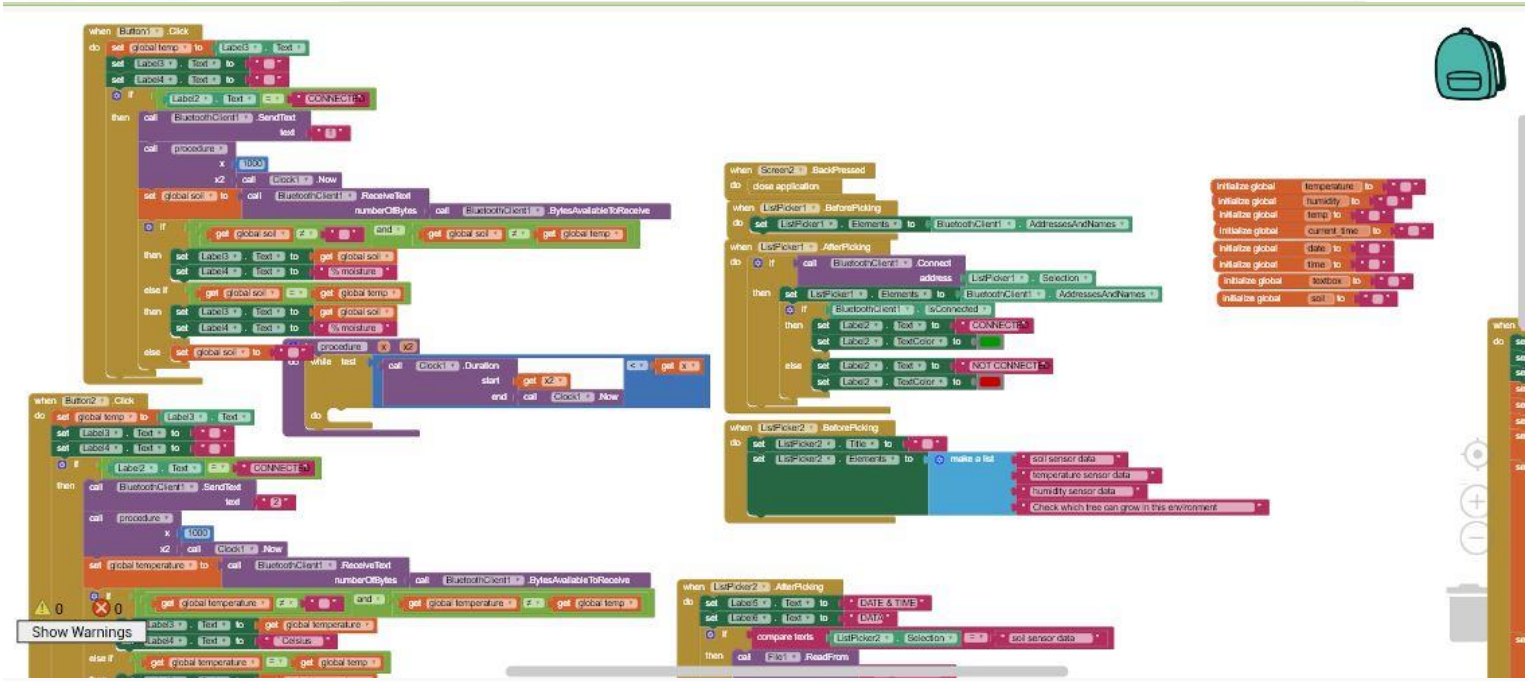
58.00 % humidity

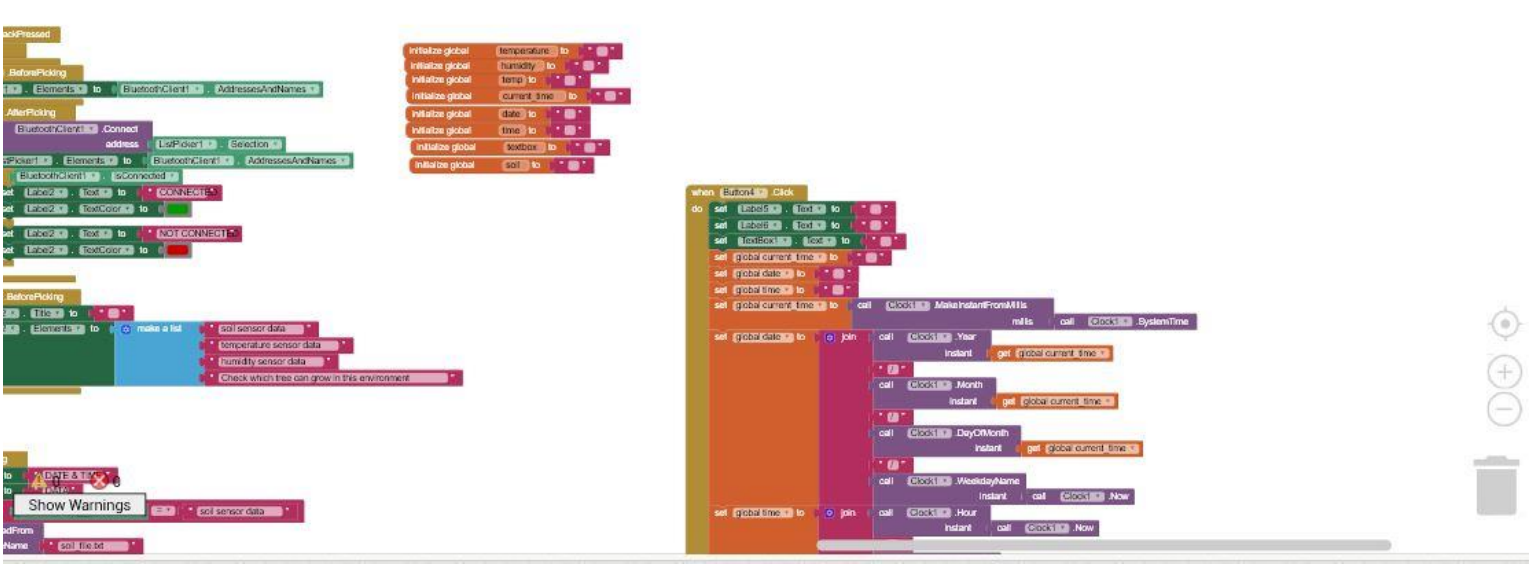
SOIL MOISTURE | TEMPERATURE | HUMIDITY

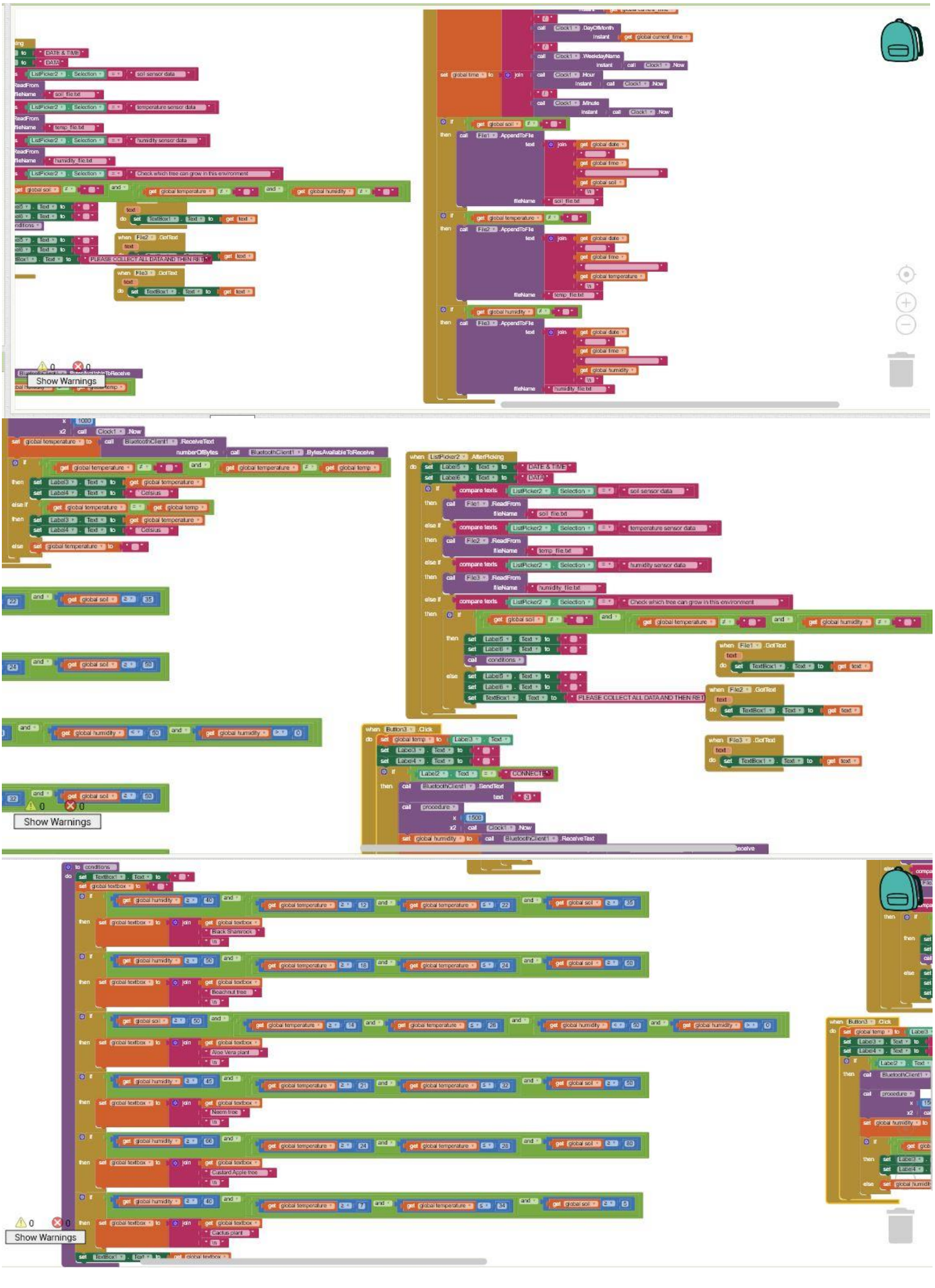
SAVE DATA | DISPLAY DATA

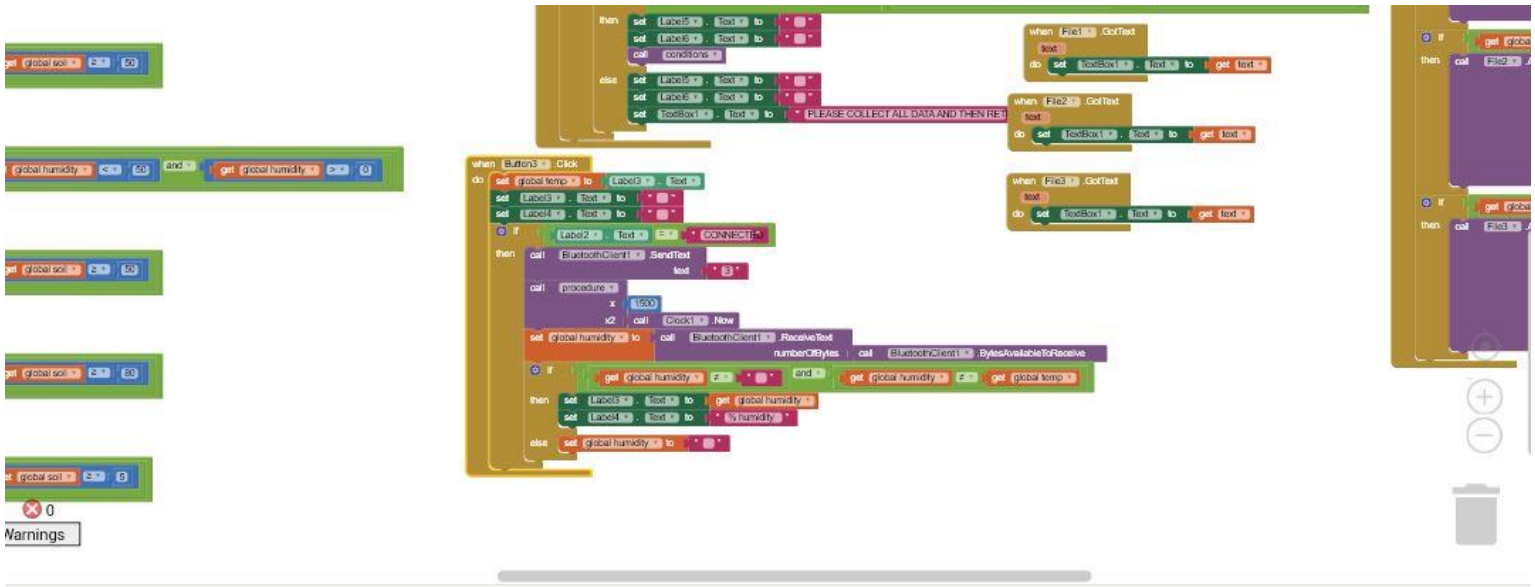
DATE & TIME		DATA
2019/1/2/Wednesday	10/38	67.00
2019/1/2/Wednesday	10/39	67.00
2019/1/2/Wednesday	11/2	71.00
2019/1/2/Wednesday	11/10	73.00
2019/1/3/Thursday	20/29	60.00
2019/1/3/Thursday	23/14	58.00




Show Warnings


Show Warnings


Show Warnings
Show Warnings
Show Warnings


when Button3 .Click
when File1 .GotText
when File2 .GotText
when File3 .GotText
PLEASE COLLECT ALL DATA AND THEN RET
CONNECTED
0
Warnings