TEAM ID : PNT2022TMID12796

PROJECT TITLE : Industry-Specific Intelligent Fire Management System

Sprint - 4

PROGRAM

```
#include "DHTesp.h"
#include <cstdlib>
#include <time.h>

const int DHT_PIN = 15;

bool is_exhaust_fan_on = false;
bool is_sprinkler_on = false;

float temperature  = 0;

int gas_ppm = 0;
int fire = 0;
int flow = 0;

String fire_status = "";
String accident_status = "";
String sprinkler_status = "";

DHTesp dhtSensor;

void setup() {
```

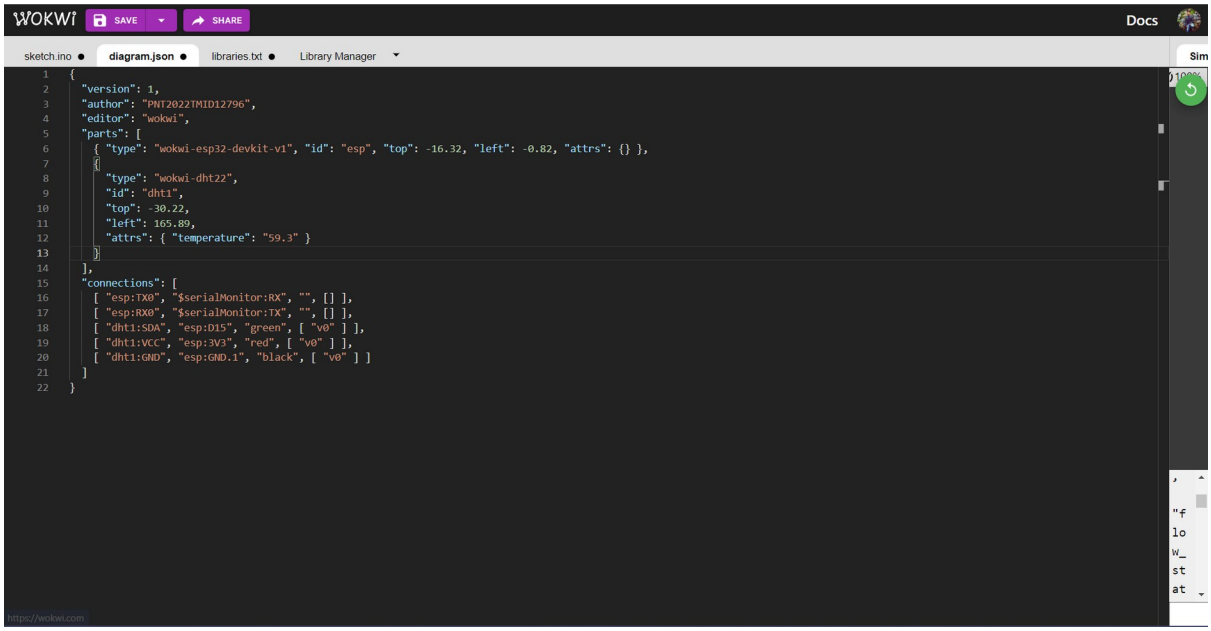
```
  Serial.begin(99900);
  dhtSensor.setup(DHT_PIN, DHTesp::DHT22);
}

void loop() {

  TempAndHumidity  data = dhtSensor.getTempAndHumidity();



  srand(time(0));

  temperature  = data.temperature;
  gas_ppm = rand()%1000;
  int firereading = rand()%1024;
  fire = map(firereading,0,1024,0,1024);
  int firerange = map(firereading,0,1024,0,3);
  int flow = ((rand()%100)>50?1:0);

  switch (firerange) {
  case 2:
    fire_status = "Close Fire";
    break;
  case 1:
    fire_status = "Distant Fire";
    break;
  case 0:
    fire_status = "No Fire";
```

```
  break;
}



if(gas_ppm > 100){
  is_exhaust_fan_on = true;
}
else{
  is_exhaust_fan_on = false;
}
if(temperature < 40 && firerange ==2){
  accident_status = "need auditing";
  is_sprinkler_on = false;
}
else if(temperature < 40 && firerange ==0){
  accident_status = "nothing found";
  is_sprinkler_on = false;
}
else if(temperature > 50 && firerange == 1){
  is_sprinkler_on = true;
  accident_status = "moderate";
}
else if(temperature > 55 && firerange == 2){
  is_sprinkler_on = true;
  accident_status = "severe";
}else{
  is_sprinkler_on = false;
```

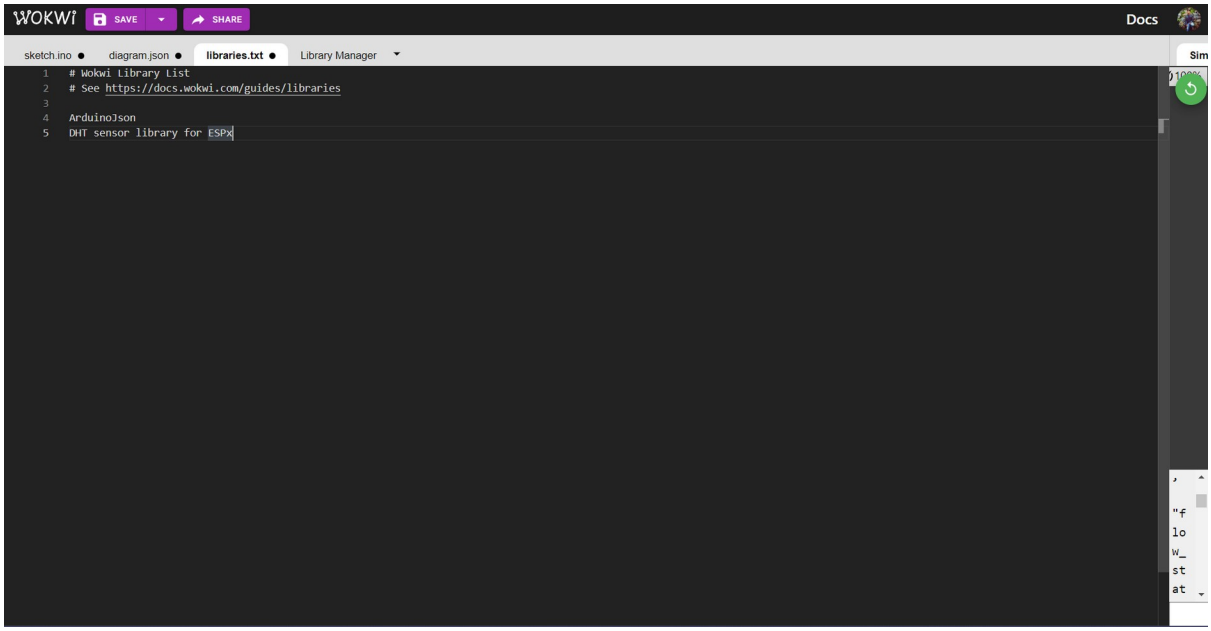
```
  accident_status = "nil";
 }

 if(is_sprinkler_on){
  if(flow){
   sprinkler_status = "working";
  }
  else{
   sprinkler_status = "not working";
  }
 }
 else if(is_sprinkler_on == false){
  sprinkler_status = "now it shouldn't";
 }
 else{
  sprinkler_status = "something's wrong";
 }

 String out = "{\n\t\"senor_values\":{";
 out+="\n\t\t\"gas_ppm\":"+String(gas_ppm)+",";
 out+="\n\t\t\"temperature\":"+String(temperature,2)+",";
 out+="\n\t\t\"fire\":"+String(fire)+",";
 out+="\n\t\t\"flow\":"+String(flow)+",\n\t}";
 out+="\n\t\"output\":{";
 out+="\n\t\
t\"is_exhaust_fan_on\":"+String((is_exhaust_fan_on)?"true":"false")+",";
 out+="\n\t\t\"is_sprinkler_on\":"+String((is_sprinkler_on)?"true":"false")+",";
```

```
  out+="\n\t}";
  out+="\n\t\"messages\":{";
  out+="\n\t\t\"fire_status\":"+fire_status+",";
  out+="\n\t\t\"flow_status\":"+sprinkler_status+",";
  out+="\n\t\t\"accident_status\":"+accident_status+",";
  out+="\n\t}";
  out+="\n}";
  Serial.println(out);

  delay(1000);
}
```

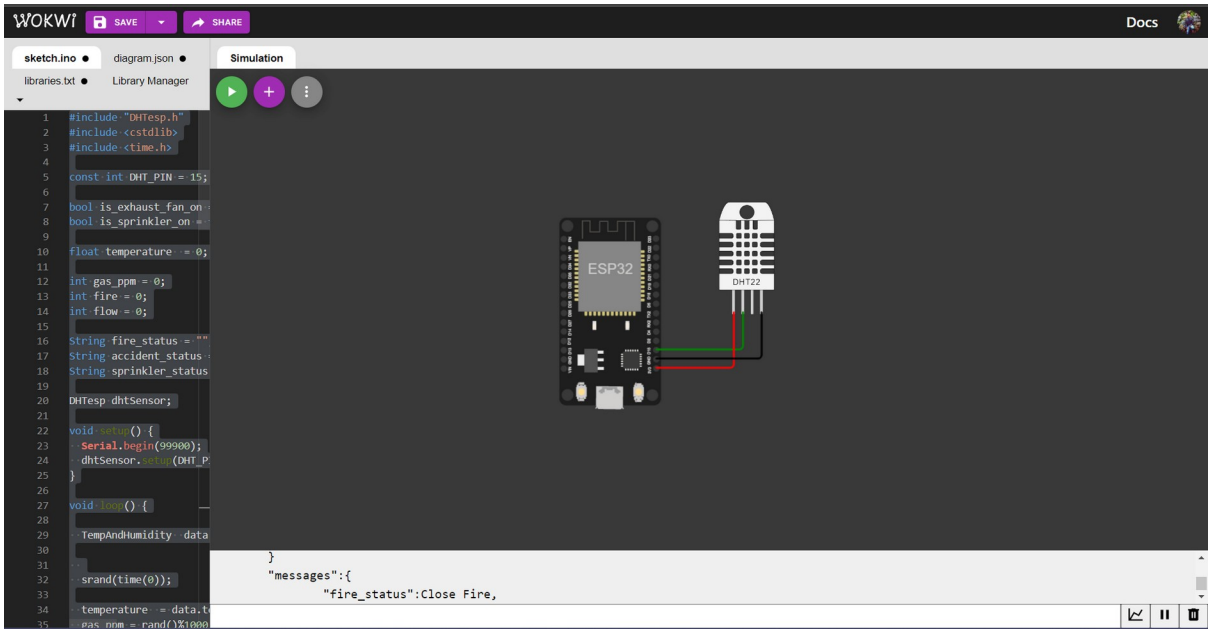
DIAGRAM.JSON:



LIBRARIES TEXT:



CIRCUIT:

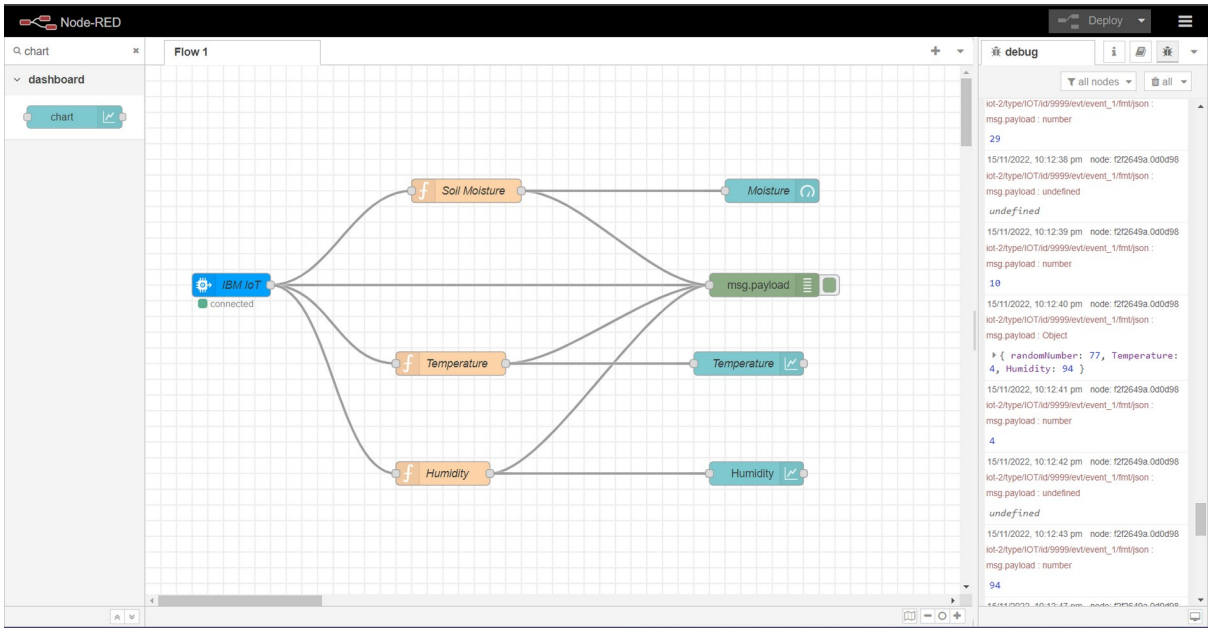


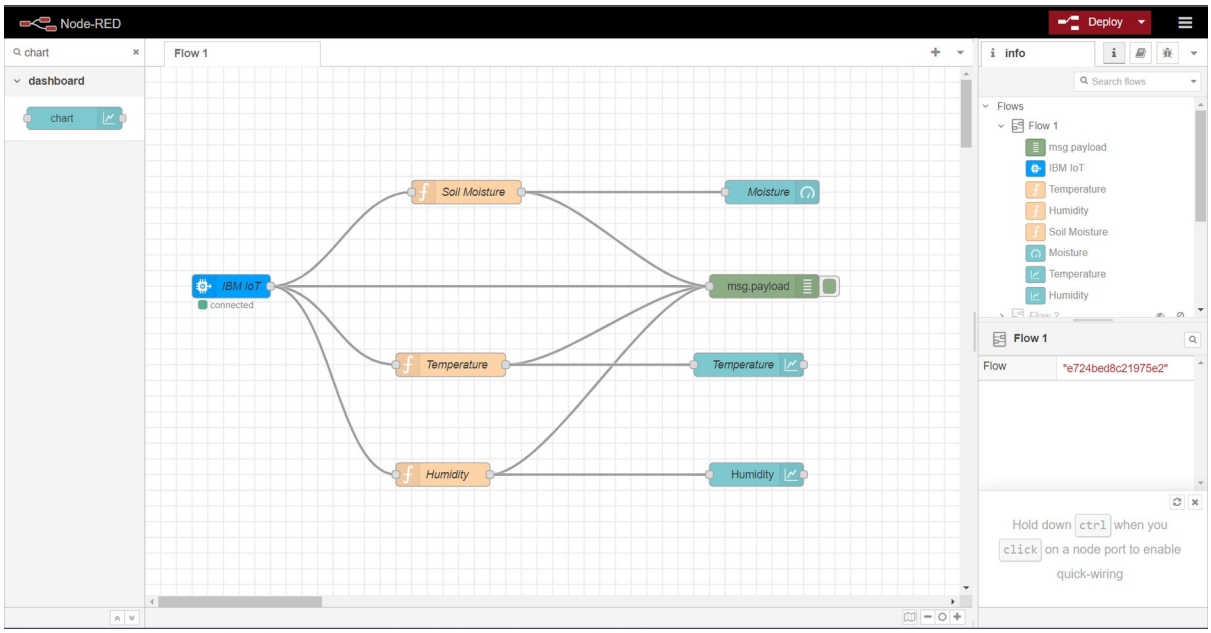
OUTPUT:

WOKWI LINK:

https://wokwi.com/projects/348467067916124756

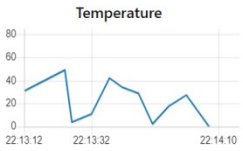
USE DASHBOARD FOR CREATING UI(WEB APP)


Node-RED
Deploy
chart
dashboard
chart
Flow 1
Soil Moisture
Moisture
IBM IoT
connected
msg.payload
Temperature
Temperature
Humidity
Humidity
debug
all nodes
all
iot-2/type/IOT/id/9999/evt/event_1/fmt/json : msg.payload : number
29
15/11/2022, 10:12:38 pm node: f2f2649a.0d0d98 iot-2/type/IOT/id/9999/evt/event_1/fmt/json : msg.payload : undefined
undefined
15/11/2022, 10:12:39 pm node: f2f2649a.0d0d98 iot-2/type/IOT/id/9999/evt/event_1/fmt/json : msg.payload : number
10
15/11/2022, 10:12:40 pm node: f2f2649a.0d0d98 iot-2/type/IOT/id/9999/evt/event_1/fmt/json : msg.payload : Object
{ randomNumber: 77, Temperature: 4, Humidity: 94 }
15/11/2022, 10:12:41 pm node: f2f2649a.0d0d98 iot-2/type/IOT/id/9999/evt/event_1/fmt/json : msg.payload : number
4
15/11/2022, 10:12:42 pm node: f2f2649a.0d0d98 iot-2/type/IOT/id/9999/evt/event_1/fmt/json : msg.payload : undefined
undefined
15/11/2022, 10:12:43 pm node: f2f2649a.0d0d98 iot-2/type/IOT/id/9999/evt/event_1/fmt/json : msg.payload : number
94

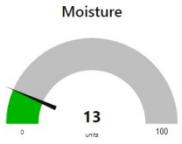

Node-RED
Deploy
chart
dashboard
chart
Flow 1
Soil Moisture
Moisture
IBM IoT
connected
msg.payload
Temperature
Temperature
Humidity
Humidity
info
Search flows
Flows
Flow 1
msg.payload
IBM IoT
Temperature
Humidity
Soil Moisture
Moisture
Temperature
Humidity
Flow 1
Flow
"e724bed8c21975e2"
Hold down ctrl when you click on a node port to enable quick-wiring

Home

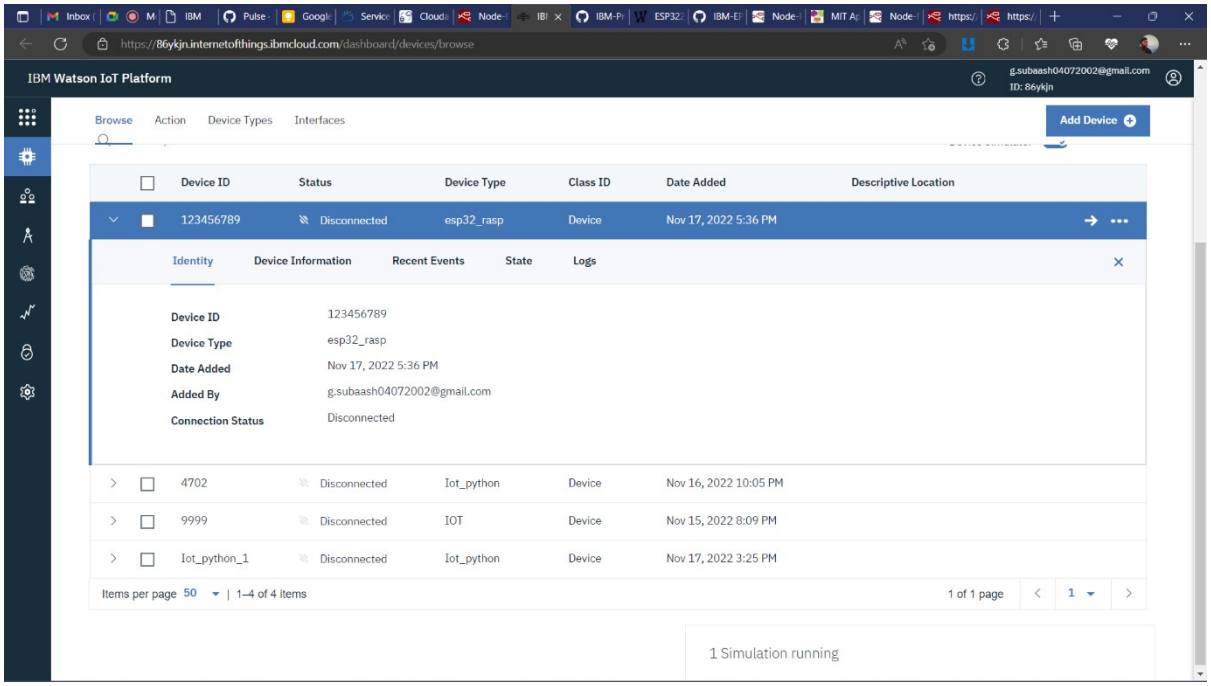
Temperature

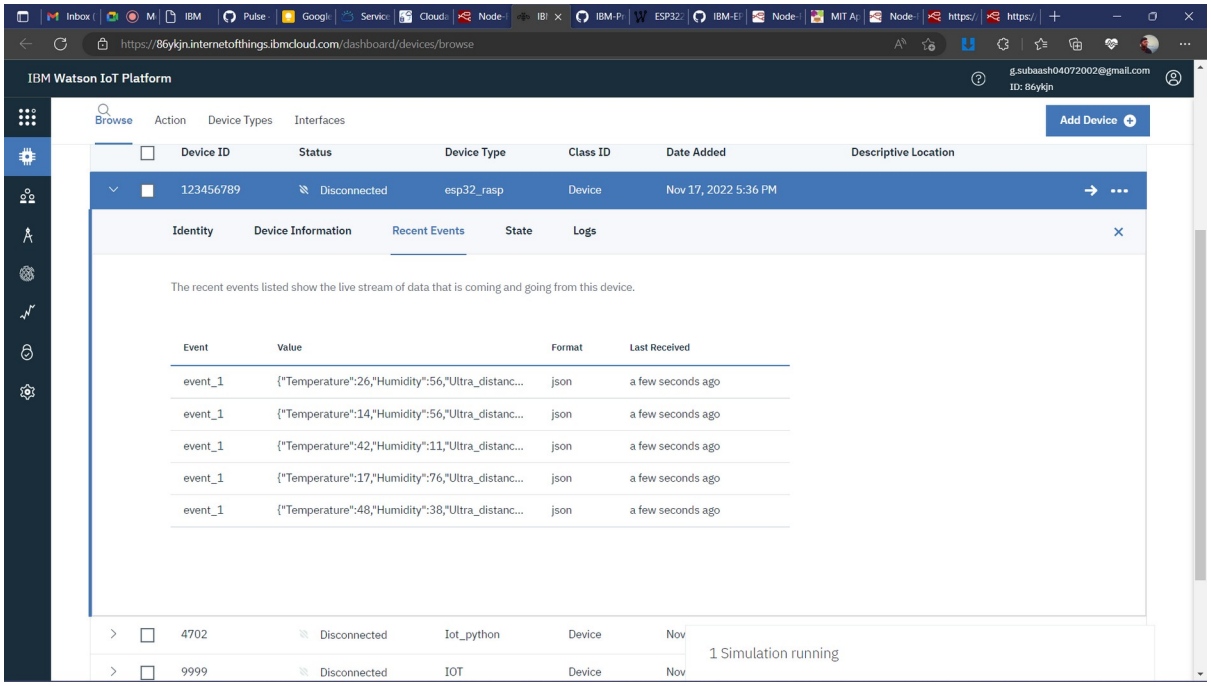


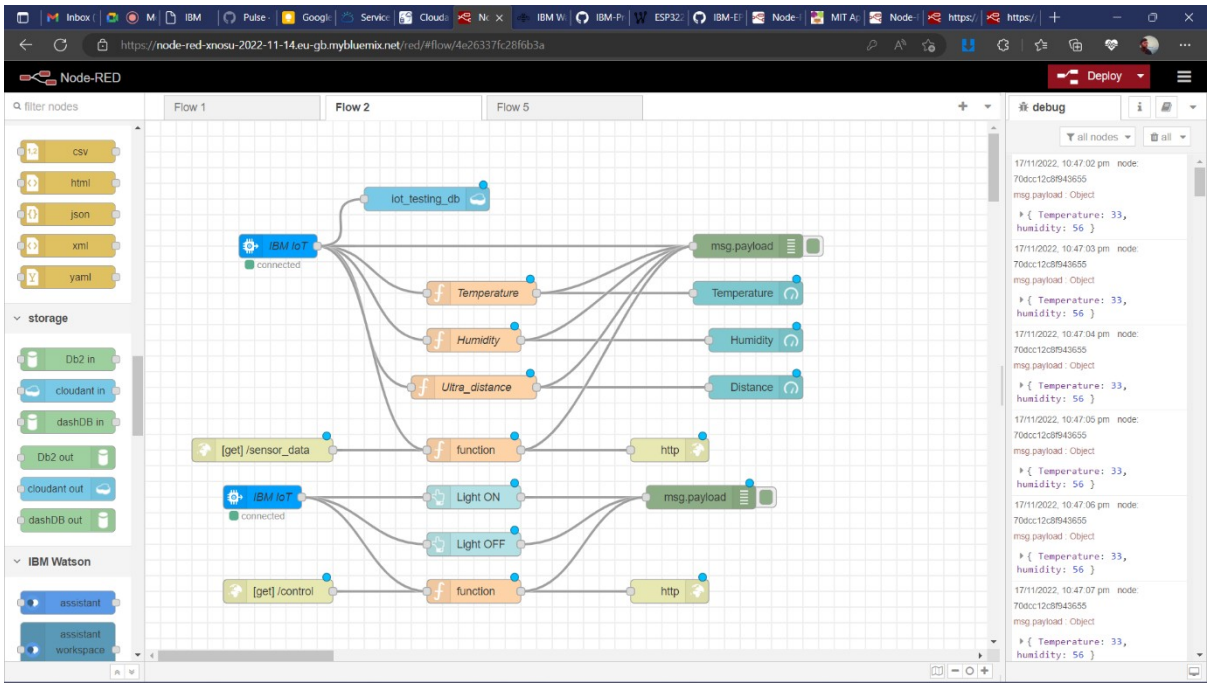
Soil Moisture

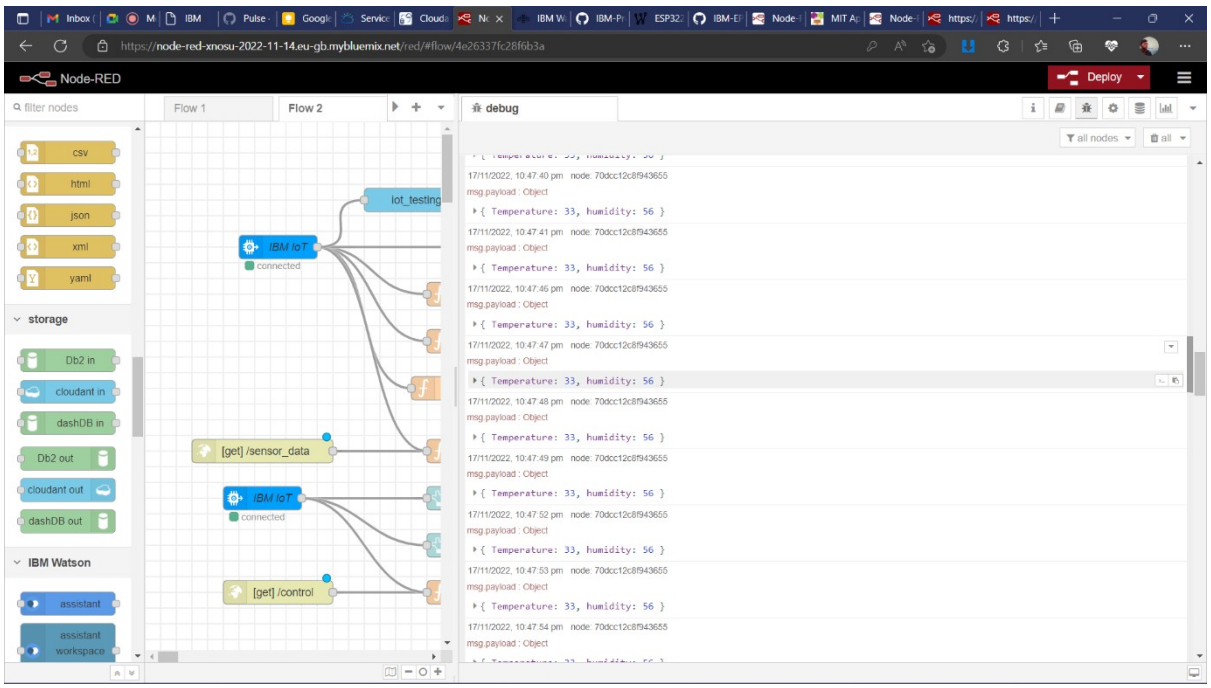


CONNECTING MIT APP INVENTOR TO IBM AND NODE RED






Node-RED
Deploy
Flow 1
Flow 2
Flow 5
debug
filter nodes
csv
html
json
xml
yaml
storage
Db2 in
cloudant in
dashDB in
Db2 out
cloudant out
dashDB out
IBM Watson
assistant
assistant workspace
Iot_testing_db
IBM IoT
connected
Temperature
Humidity
Ultra_distance
msg.payload
Temperature
Humidity
Distance
[get] /sensor_data
function
http
Light ON
Light OFF
[get] /control
all nodes
17/11/2022, 10:47:02 pm node: 70dcc12c8f943655
msg.payload : Object
{ Temperature: 33, humidity: 56 }
17/11/2022, 10:47:03 pm node: 70dcc12c8f943655
17/11/2022, 10:47:04 pm node: 70dcc12c8f943655
17/11/2022, 10:47:05 pm node: 70dcc12c8f943655
17/11/2022, 10:47:06 pm node: 70dcc12c8f943655
17/11/2022, 10:47:07 pm node: 70dcc12c8f943655


Node-RED
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Db2 in
cloudant in
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Db2 out
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assistant
assistant workspace
IBM IoT
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[get] /control
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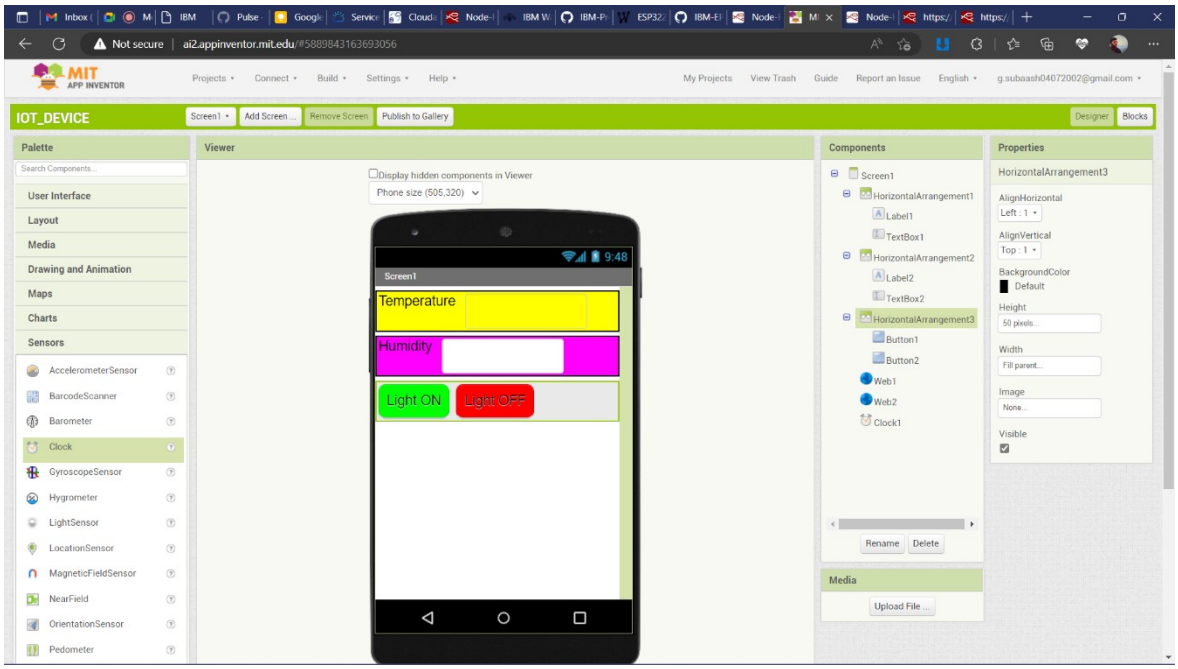
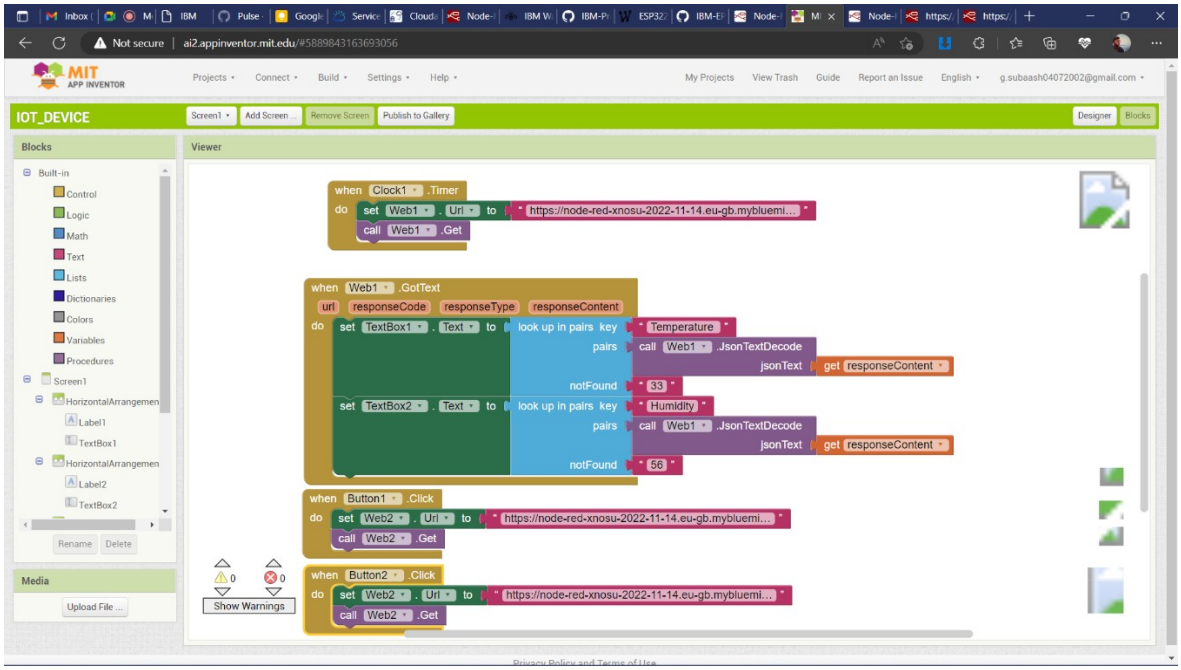
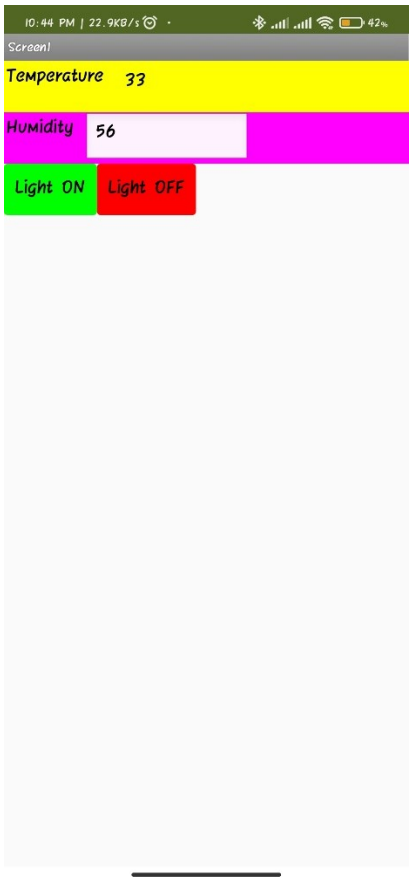
msg.payload : Object
{ Temperature: 33, humidity: 56 }
17/11/2022, 10:47:41 pm node: 70dcc12c8f943655
17/11/2022, 10:47:46 pm node: 70dcc12c8f943655
17/11/2022, 10:47:47 pm node: 70dcc12c8f943655
17/11/2022, 10:47:48 pm node: 70dcc12c8f943655
17/11/2022, 10:47:49 pm node: 70dcc12c8f943655
17/11/2022, 10:47:52 pm node: 70dcc12c8f943655
17/11/2022, 10:47:53 pm node: 70dcc12c8f943655
17/11/2022, 10:47:54 pm node: 70dcc12c8f943655


Not secure | ai2.appinventor.mit.edu/#5889843163693056
MIT APP INVENTOR
Projects Connect Build Settings Help
My Projects View Trash Guide Report an Issue English g.subaash04072002@gmail.com
IOT_DEVICE
Screen1 Add Screen Remove Screen Publish to Gallery
Designer Blocks
Palette
User Interface
Layout
Media
Drawing and Animation
Maps
Charts
Sensors
AccelerometerSensor
BarcodeScanner
Barometer
Clock
GyroscopeSensor
Hygrometer
LightSensor
LocationSensor
MagneticFieldSensor
NearField
OrientationSensor
Pedometer
Viewer
Display hidden components in Viewer
Phone size (505,320)
9:48
Screen1
Temperature
Humidity
Light ON
Light OFF
Components
Screen1
HorizontalArrangement1
Label1
TextBox1
HorizontalArrangement2
Label2
TextBox2
HorizontalArrangement3
Button1
Button2
Web1
Web2
Clock1
Rename Delete
Media
Upload File ...
Properties
HorizontalArrangement3
AlignHorizontal
Left : 1
AlignVertical
Top : 1
BackgroundColor
Default
Height
50 pixels...
Width
Fill parent...
Image
None...
Visible


Not secure | ai2.appinventor.mit.edu/#5889843163693056
MIT APP INVENTOR
Projects Connect Build Settings Help
My Projects View Trash Guide Report an Issue English g.subaash04072002@gmail.com
IOT_DEVICE
Screen1 Add Screen Remove Screen Publish to Gallery
Designer Blocks
Blocks
Built-in
Control
Logic
Math
Text
Lists
Dictionaries
Colors
Variables
Procedures
Screen1
HorizontalArrangemen
Label1
TextBox1
HorizontalArrangemen
Label2
TextBox2
Rename Delete
Media
Upload File ...
Show Warnings
Viewer
when Clock1 .Timer
do set Web1 . Url to " https://node-red-xnosu-2022-11-14.eu-gb.mybluemi... "
call Web1 .Get
when Web1 .GotText
url responseCode responseType responseContent
do set TextBox1 . Text to look up in pairs key " Temperature "
pairs call Web1 .JsonTextDecode
jsonText get responseContent
notFound " 33 "
set TextBox2 . Text to look up in pairs key " Humidity "
pairs call Web1 .JsonTextDecode
jsonText get responseContent
notFound " 66 "
when Button1 .Click
do set Web2 . Url to " https://node-red-xnosu-2022-11-14.eu-gb.mybluemi... "
call Web2 .Get
when Button2 .Click
do set Web2 . Url to " https://node-red-xnosu-2022-11-14.eu-gb.mybluemi... "
call Web2 .Get


10:44 PM | 22.9KB/s
42%
Screen1
Temperature
33
Humidity
56
Light ON
Light OFF