Final Deliverables

Date	19 November 2022
Team ID	PNT2022TMID04334
Project Name	Gas leakage monitoring and alerting system for industries

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
#include "DHTesp.h"
#include<stdio.h>
#include <stdlib.h>
#define LED 2
const int DHT_PIN = 15;
DHTesp dhtSensor;
int gas;
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
#define ORG "oyi7sh"
#define DEVICE_TYPE "Gas_leakage"
#define DEVICE_ID "154555"
#define TOKEN "WoOgbWlz4q-F4KQKc-"
String data3;
IPAddress myDns(127, 0, 0, 53);
char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char subscribetopic[] = "iot-2/cmd/test/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
```

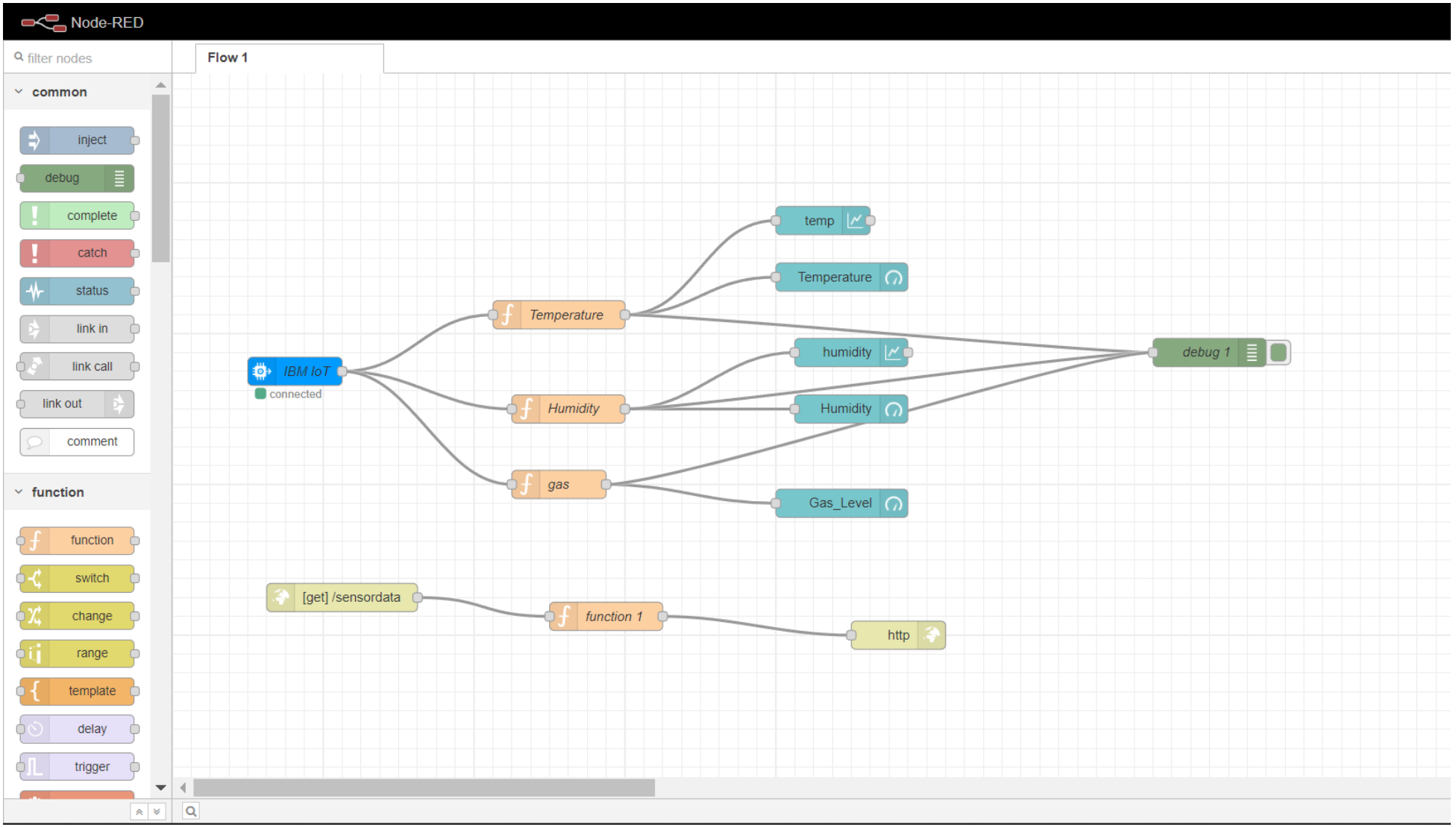
```
WiFiClient wificlient;
PubSubClient client (server, 1883, callback,wificlient);

void setup()
{
  Serial.begin(115200);
  dhtSensor.setup(DHT_PIN, DHTesp::DHT22);
  pinMode(LED, OUTPUT);
  delay(10);
  wificonnect();
  mqttconnect();
}
void loop()
{
    TempAndHumidity  data = dhtSensor.getTempAndHumidity();
    gas=random(10000);
    Serial.println("Temp: " + String(data.temperature, 2) + "°C");
    Serial.println("Humidity: " + String(data.humidity, 1) + "%");
    Serial.println("gas_val " + String(gas));
    PublishData(String(data.temperature,2),String(data.humidity,
1),String(gas),int(data.temperature),int(data.humidity),int(gas));
    delay(1000);
    if (!client.loop()) {
      mqttconnect();
    }
}
void PublishData(String temp,String hum,String gas1,int temp1,int hum1,int gas2)
{
  mqttconnect();
  if (gas2>2000)
  {
    digitalWrite(LED, HIGH);
```

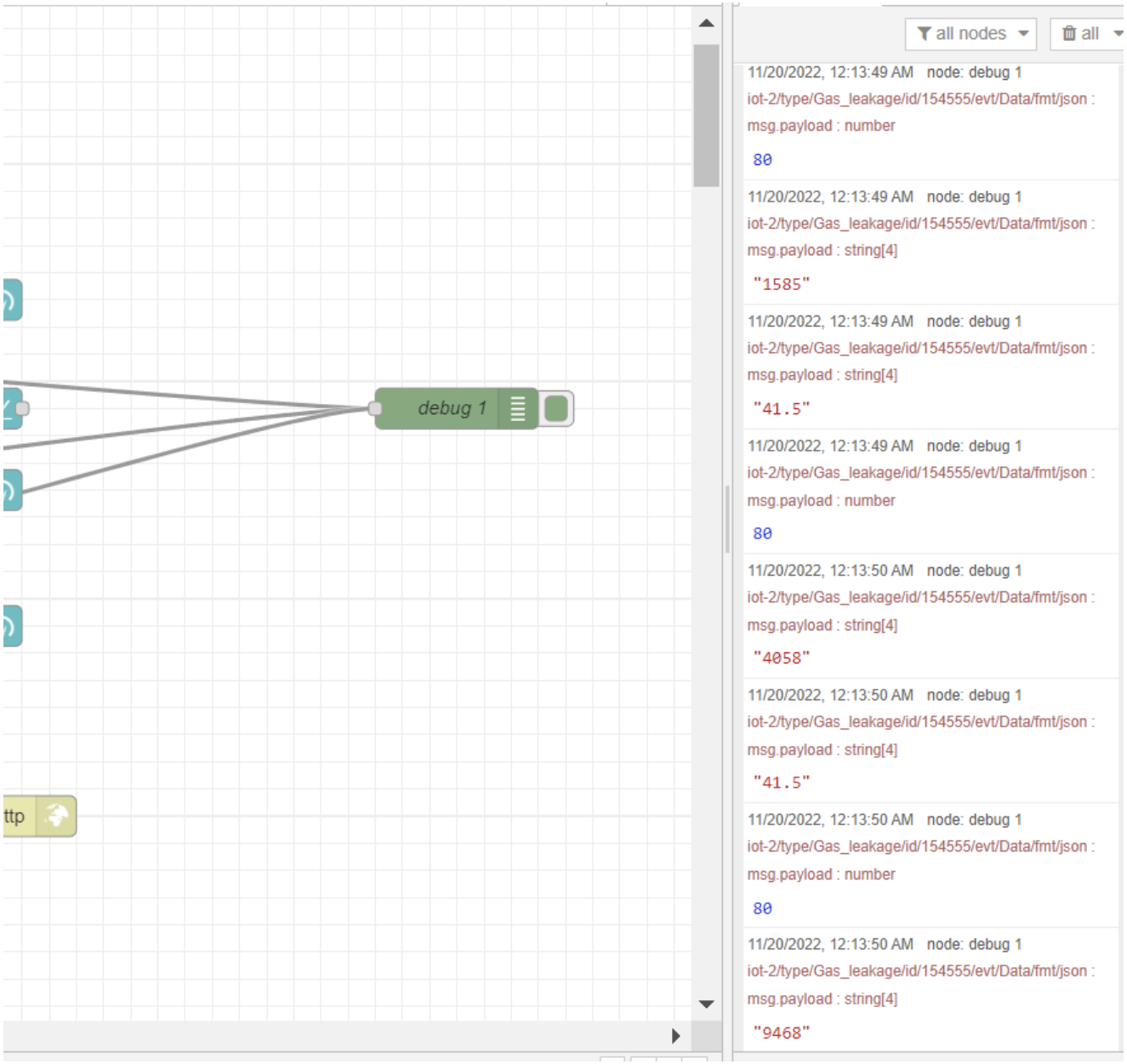
```
    Serial.println("Fire alert");
  }
  else
  {
    digitalWrite(LED, LOW);
    Serial.println("Normal");
  }
  String payload = "{\"temperature\":";
  payload += temp;
  payload += "," "\"humidity\":\"";
  payload += hum;
  payload += "\"";
  payload += "," "\"gas_level\":\"";
  payload += gas1;
  payload += "\"}";

  Serial.print("Sending payload: ");
  // Serial.println(payload);
  if (client.publish(publishTopic, (char*) payload.c_str()))
  {
    Serial.println("Data sent successfully");
  }
  else
  {
    Serial.println("Data sent failure");
  }
  Serial.println("---");
}
void mqttconnect()
{
  if (!client.connected())
  {
```

```
    Serial.print("Reconnecting client to ");
    Serial.println(server);
    while (!!!client.connect(clientId, authMethod, token))
    {
      Serial.print(".");
      delay(500);
    }
    initManagedDevice();
    Serial.println();
  }
}
void wificonnect()
{
  Serial.println();
  Serial.print("Connecting to ");
  WiFi.begin("Wokwi-GUEST", "", 6);
  while (WiFi.status() != WL_CONNECTED)
  {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WiFi connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());
}
void initManagedDevice()
{
  if (client.subscribe(subscribetopic))
  {
    Serial.println((subscribetopic));
    Serial.println("subscribe to cmd OK");
```

```
  }
  else
  {
    Serial.println("subscribe to cmd FAILED");
  }
}
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
  Serial.print("callback invoked for topic: ");
  Serial.println(subscribetopic);
  for (int i = 0; i < payloadLength; i++)
  {
    data3 += (char)payload[i];
  }
  data3="";
}
```

Node-red:

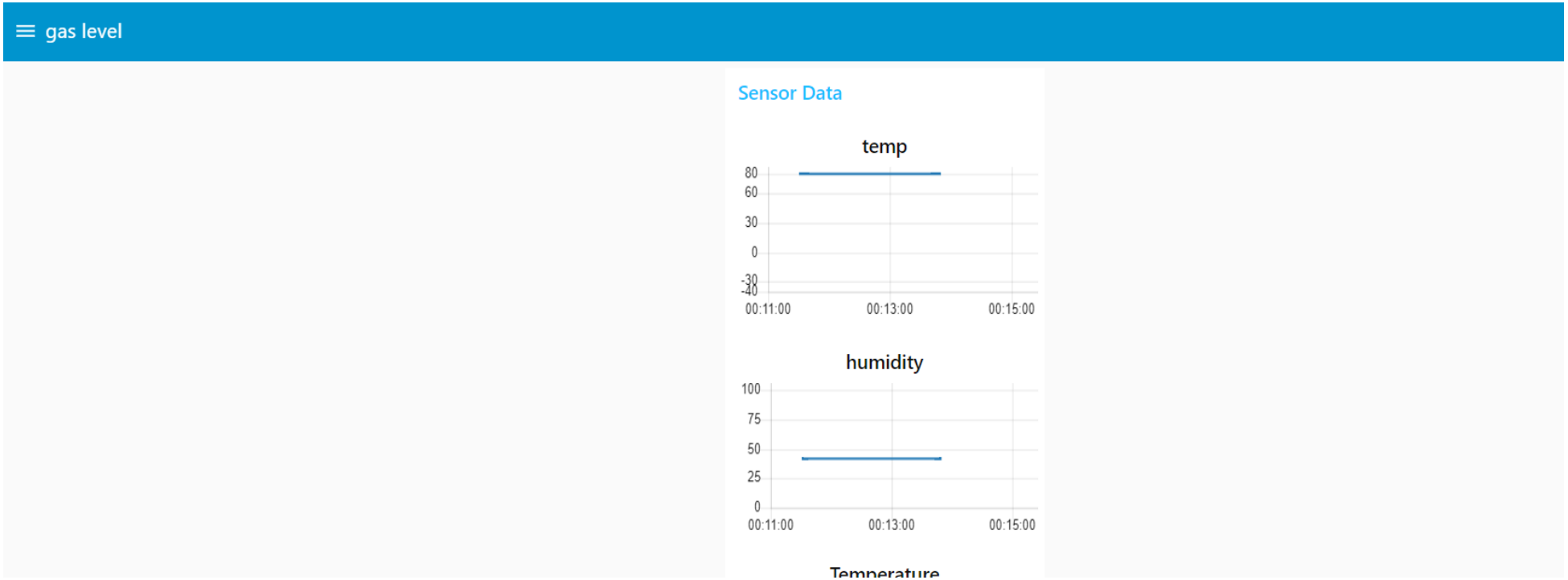

Node-RED
filter nodes
Flow 1
common
inject
debug
complete
catch
status
link in
link call
link out
comment
function
function
switch
change
range
template
delay
trigger
IBM IoT
connected
Temperature
Humidity
gas
temp
Temperature
humidity
Humidity
Gas_Level
debug 1
[get] /sensordata
function 1
http

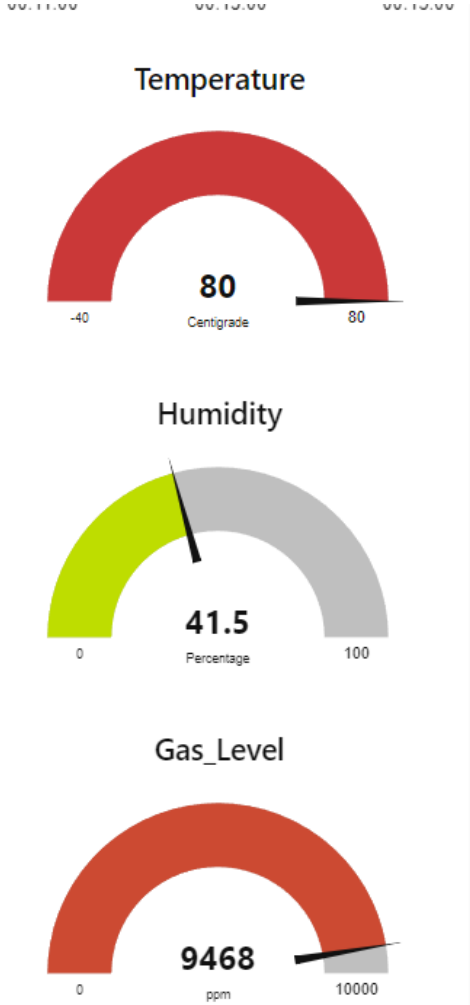

debug 1
ttp
all nodes
all
11/20/2022, 12:13:49 AM node: debug 1
iot-2/type/Gas_leakage/id/154555/evt/Data/fmt/json : msg.payload : number
80
11/20/2022, 12:13:49 AM node: debug 1
iot-2/type/Gas_leakage/id/154555/evt/Data/fmt/json : msg.payload : string[4]
"1585"
11/20/2022, 12:13:49 AM node: debug 1
iot-2/type/Gas_leakage/id/154555/evt/Data/fmt/json : msg.payload : string[4]
"41.5"
11/20/2022, 12:13:49 AM node: debug 1
iot-2/type/Gas_leakage/id/154555/evt/Data/fmt/json : msg.payload : number
80
11/20/2022, 12:13:50 AM node: debug 1
iot-2/type/Gas_leakage/id/154555/evt/Data/fmt/json : msg.payload : string[4]
"4058"
11/20/2022, 12:13:50 AM node: debug 1
iot-2/type/Gas_leakage/id/154555/evt/Data/fmt/json : msg.payload : string[4]
"41.5"
11/20/2022, 12:13:50 AM node: debug 1
iot-2/type/Gas_leakage/id/154555/evt/Data/fmt/json : msg.payload : number
80
11/20/2022, 12:13:50 AM node: debug 1
iot-2/type/Gas_leakage/id/154555/evt/Data/fmt/json : msg.payload : string[4]
"9468"

Values:

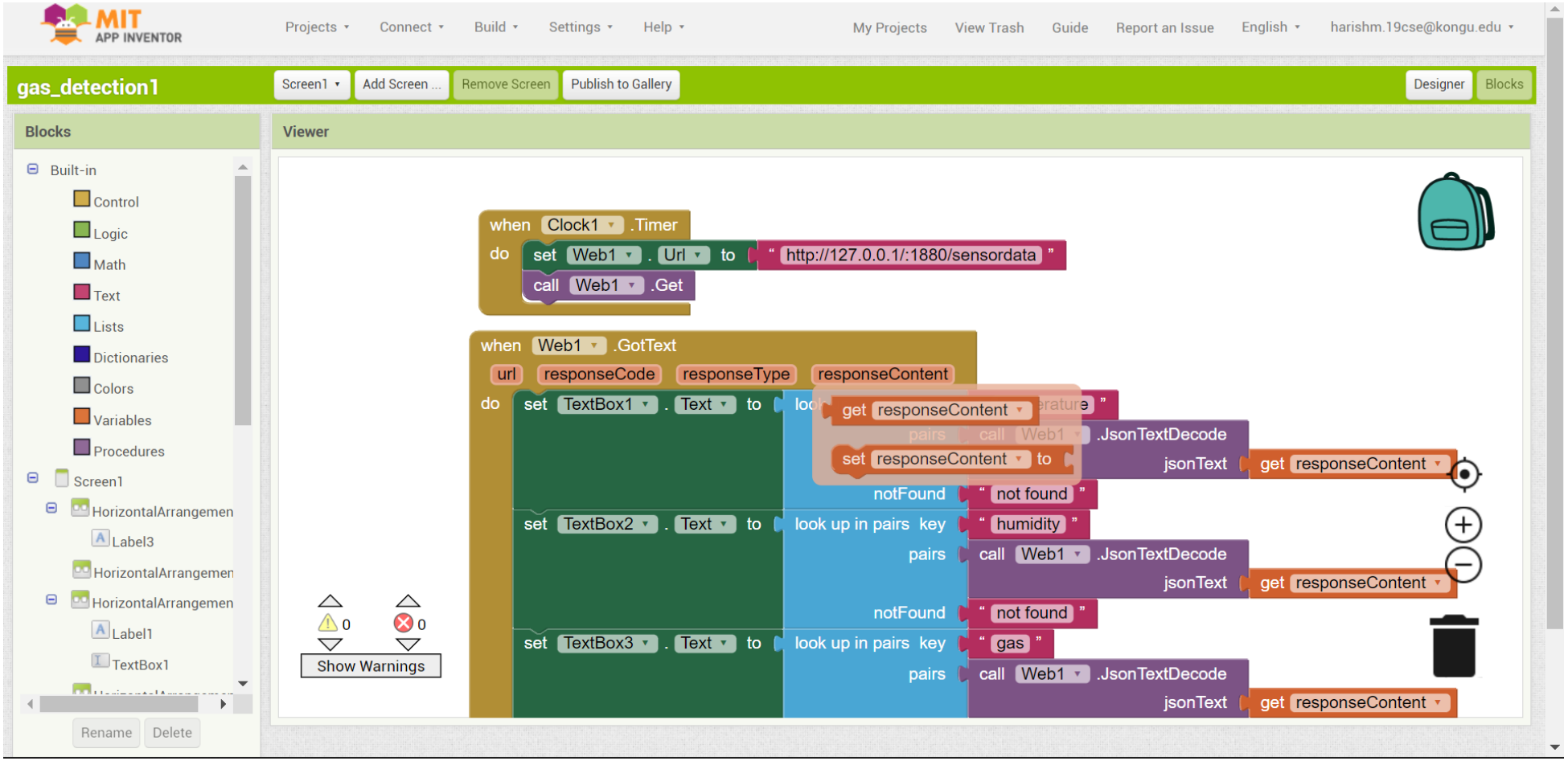

127.0.0.1:1880/sensordata
JupyterHub
UNSW-NB15-Files - C...
How to Install PIP on...
Routing Attacks and...
{"temperature":80,"humidity":"41.5","gas":"9468"}

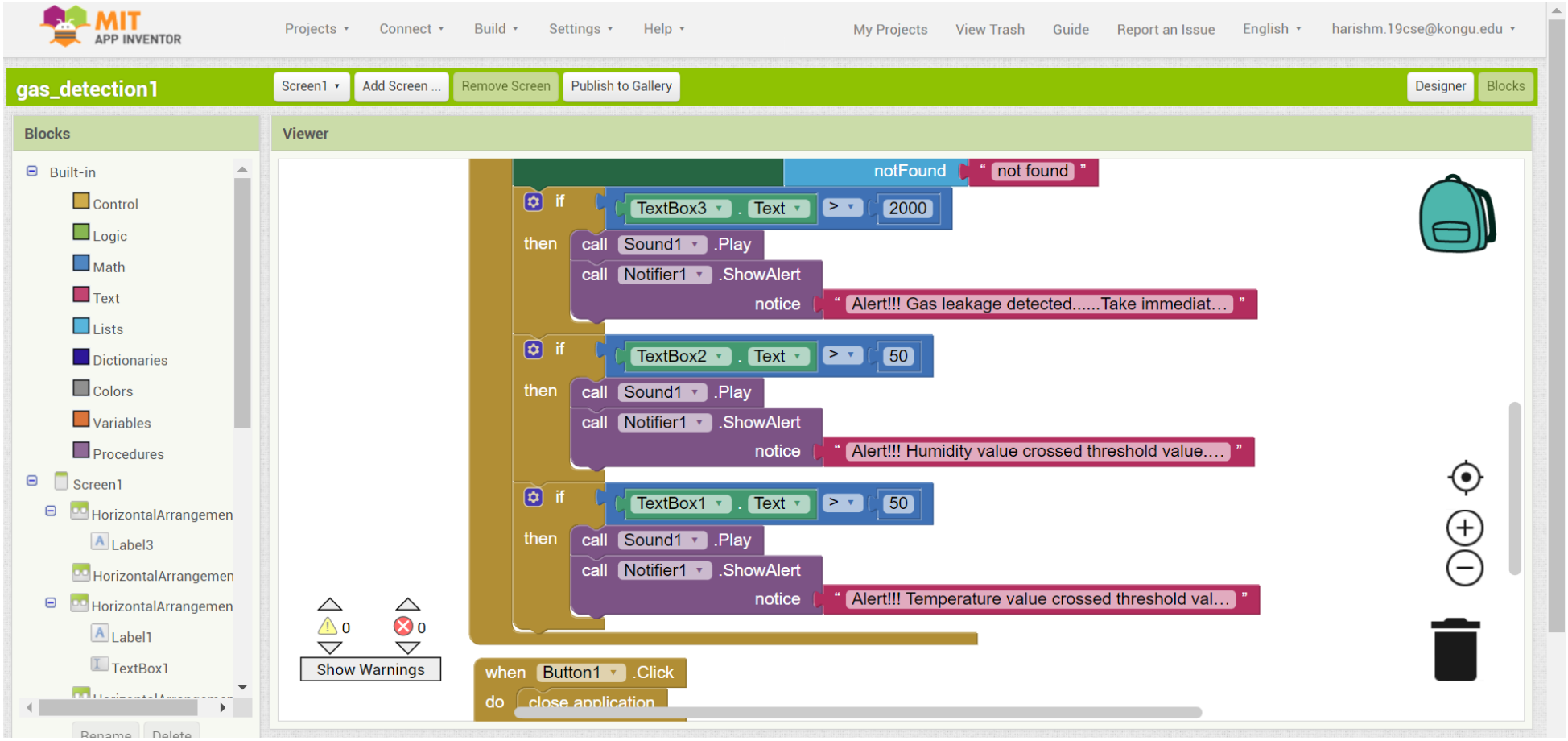
Web app:


gas level
Sensor Data
temp
80
60
30
0
-30
-40
00:11:00
00:13:00
00:15:00
humidity
100
75
50
25
0
00:11:00
00:13:00
00:15:00
Temperature


Temperature
80
-40
Centigrade
80
Humidity
41.5
0
Percentage
100
Gas_Level
9468
0
ppm
10000

Mobile App:


MIT APP INVENTOR
Projects
Connect
Build
Settings
Help
My Projects
View Trash
Guide
Report an Issue
English
harishm.19cse@kongu.edu
gas_detection1
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Blocks
Viewer
Built-in
Control
Logic
Math
Text
Lists
Dictionaries
Colors
Variables
Procedures
Screen1
HorizontalArrangemen
Label3
HorizontalArrangemen
HorizontalArrangemen
Label1
TextBox1
Rename
Delete
when Clock1 .Timer
do set Web1 . Url to " http://127.0.0.1/:1880/sensordata "
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 " not found "
set TextBox2 . Text to look up in pairs key " humidity "
pairs call Web1 .JsonTextDecode
jsonText get responseContent
notFound " not found "
set TextBox3 . Text to look up in pairs key " gas "
pairs call Web1 .JsonTextDecode
jsonText get responseContent
get responseContent
set responseContent to
0
0
Show Warnings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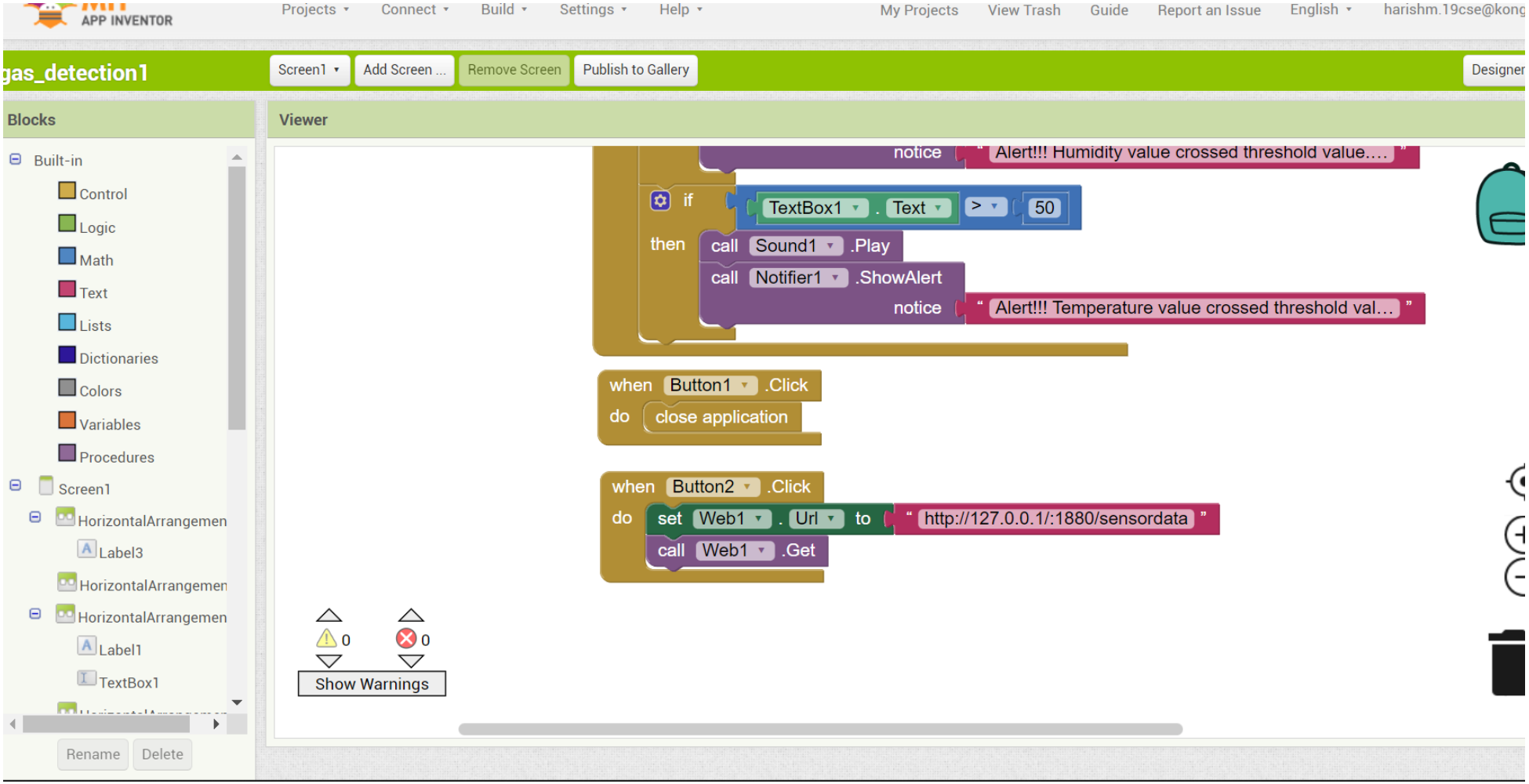
gas_detection1
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Blocks
Viewer
Built-in
Control
Logic
Math
Text
Lists
Dictionaries
Colors
Variables
Procedures
Screen1
HorizontalArrangemen
Label3
HorizontalArrangemen
HorizontalArrangemen
Label1
TextBox1
Rename
Delete
notFound
not found
if
TextBox3 . Text > 2000
then
call Sound1 .Play
call Notifier1 .ShowAlert
notice
Alert!!! Gas leakage detected.....Take immediat...
if
TextBox2 . Text > 50
then
call Sound1 .Play
call Notifier1 .ShowAlert
notice
Alert!!! Humidity value crossed threshold value....
if
TextBox1 . Text > 50
then
call Sound1 .Play
call Notifier1 .ShowAlert
notice
Alert!!! Temperature value crossed threshold val...
0
0
Show Warnings
when Button1 .Click
do close application


APP INVENTOR
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harishm.19cse@kong
gas_detection1
Screen1
Add Screen ...
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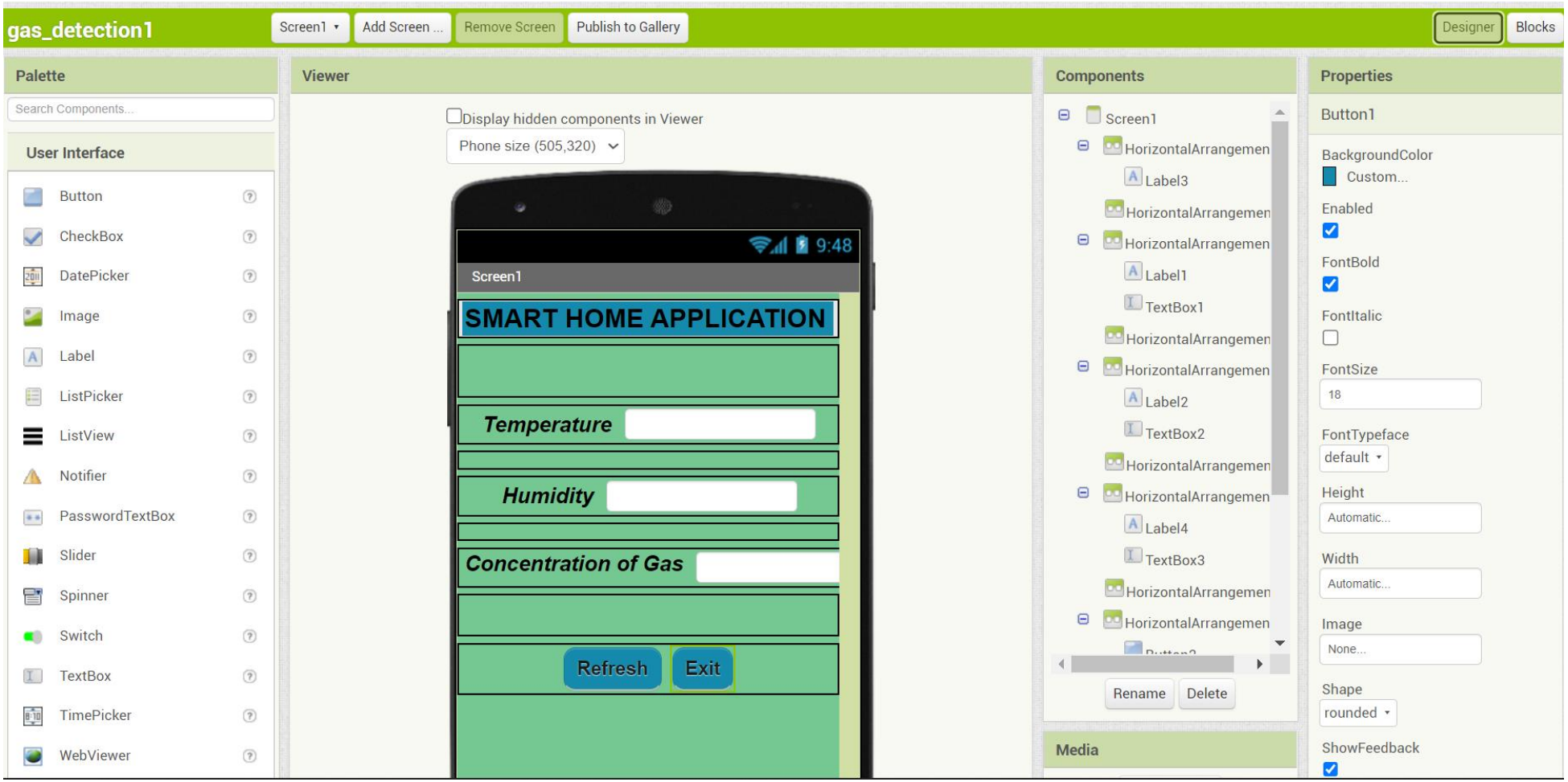
Designer
Blocks
Viewer
Built-in
Control
Logic
Math
Text
Lists
Dictionaries
Colors
Variables
Procedures
Screen1
HorizontalArrangemen
Label3
HorizontalArrangemen
HorizontalArrangemen
Label1
TextBox1
Rename
Delete
notice
" Alert!!! Humidity value crossed threshold value.... "
if
TextBox1 . Text > 50
then
call Sound1 .Play
call Notifier1 .ShowAlert
notice
" Alert!!! Temperature value crossed threshold val... "
when Button1 .Click
do close application
when Button2 .Click
do set Web1 . Url to " http://127.0.0.1/:1880/sensordata "
call Web1 .Get
0
0
Show Warnings


gas_detection1
Screen1
Add Screen ...
Remove Screen
Publish to Gallery
Designer
Blocks
Palette
Search Components...
User Interface
Button
CheckBox
DatePicker
Image
Label
ListPicker
ListView
Notifier
PasswordTextBox
Slider
Spinner
Switch
TextBox
TimePicker
WebViewer
Viewer
Display hidden components in Viewer
Phone size (505,320)
9:48
Screen1
SMART HOME APPLICATION
Temperature
Humidity
Concentration of Gas
Refresh
Exit
Components
Screen1
HorizontalArrangemen
Label3
HorizontalArrangemen
HorizontalArrangemen
Label1
TextBox1
HorizontalArrangemen
HorizontalArrangemen
Label2
TextBox2
HorizontalArrangemen
HorizontalArrangemen
Label4
TextBox3
HorizontalArrangemen
HorizontalArrangemen
Rename
Delete
Media
Properties
Button1
BackgroundColor
Custom...
Enabled
FontBold
FontItalic
FontSize
18
FontTypeface
default
Height
Automatic...
Width
Automatic...
Image
None...
Shape
rounded
ShowFeedback