ASSIGNMENT-4

TEAM ID	PNT2022TMID52326
PROJECT NAME	SMART WASTE MANAGEMENT SYSTEM IN METROPOLITAN CITIES

CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
#define ORG "tapwwl"//IBM ORGANITION ID
#define DEVICE_TYPE "ultrasonic"
#define DEVICE_ID "123456"
#define TOKEN "12345678" //Token
String data3;
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);
const int trigPin = 5;
const int echoPin = 18;
#define SOUND_SPEED 0.034
long duration;
float distance;
void setup()
  {
    Serial.begin(115200);
    pinMode(trigPin, OUTPUT);
    pinMode(echoPin, INPUT);
    wificonnect();
    mqttconnect();
    }
void loop()
  {
    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    digitalWrite(trigPin, HIGH);
```

```
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    duration = pulseIn(echoPin, HIGH);
    distance = duration * SOUND_SPEED/2;
    Serial.print("Distance (cm): ");
    Serial.println(distance);
    if(distance<100) {
      Serial.println("ALERT!!");
      delay(1000);
      PublishData(distance);
      delay(1000);
      if (!client.loop()) {
        mqttconnect();
        }
      }
    delay(1000);
    }
void PublishData(float dist)
{
  mqttconnect();
  String payload = "{\"Distance\":";
  payload += dist;
  payload += ",\"ALERT!!\":""\"Distance less than 100cms\"";
  payload += "}";
  Serial.print("Sending payload: ");
  Serial.println(payload);
  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");
    } else {
    Serial.println("Publish failed");
    }
  }
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++) {
    Serial.print((char)payload[i]);
    data3 += (char)payload[i];
    }
  Serial.println("data: "+ data3);
  data3="";
}
```

SIMULATION

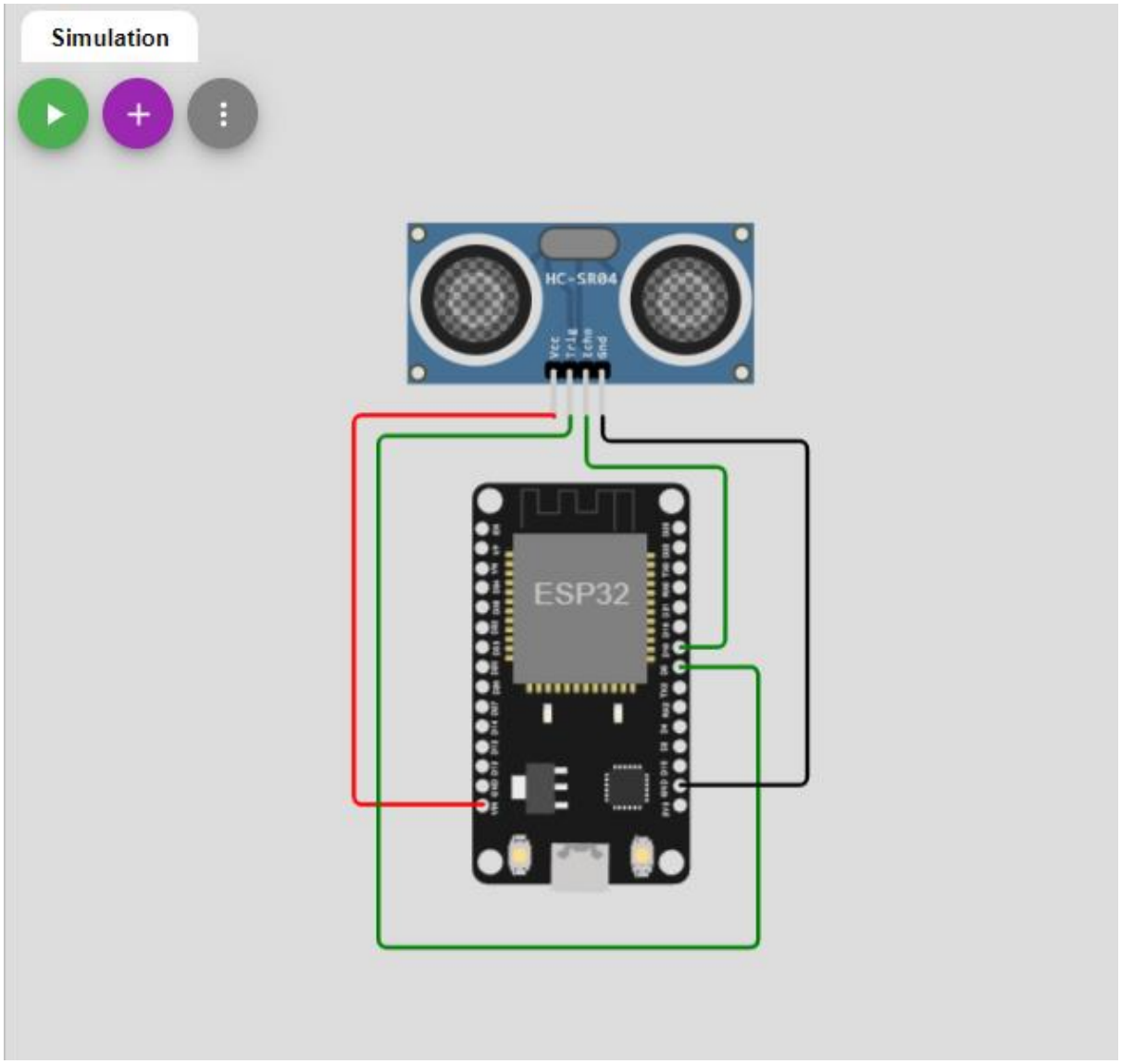
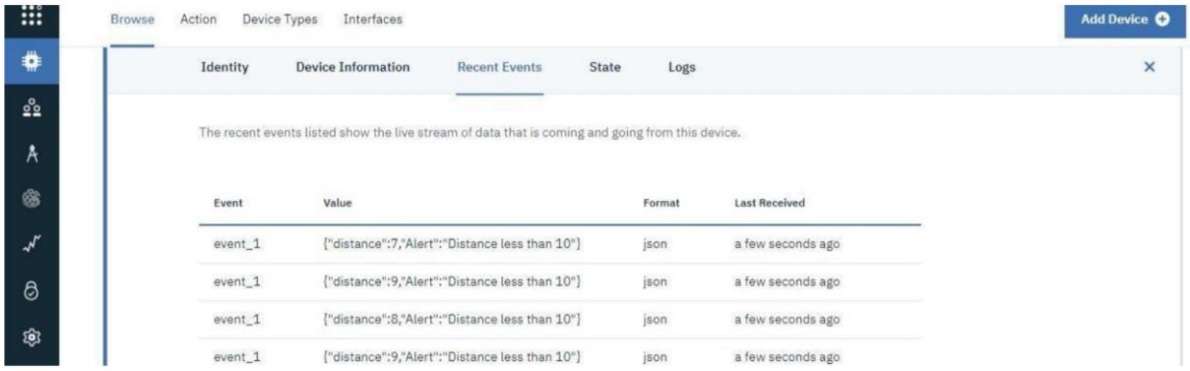


Diagram.json

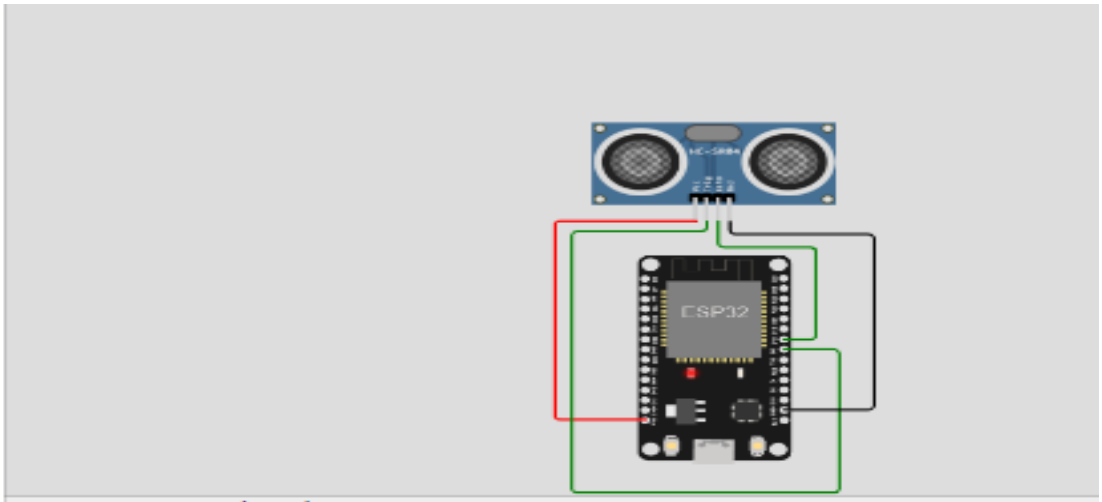
sketch.ino | diagram.json ● | libraries.txt | Library Manager

```
{
  "version": 1,
  "author": "Abins",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": 59.33, "left": 5.33, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": -66.04, "left": -26.83, "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [ "ultrasonic1:VCC", "esp:VIN", "red", [ "v-0.76", "h-97.78", "v196" ] ],
    [
      "ultrasonic1:TRIG",
      "esp:D5",
      "green",
      [ "v9.24", "h-93.67", "v250", "h185.33", "v-138.67" ]
    ],
    [ "ultrasonic1:ECHO", "esp:D18", "green", [ "v24.58", "h67.77", "v90" ] ],
    [ "ultrasonic1:GND", "esp:GND.1", "black", [ "v11.91", "h99.88", "v152" ] ]
  ]
}
```

IBM CLOUD OUTPUT



SIMULATION OUTPUT




```
Distance (cm): 399.94
Distance (cm): 399.94
Distance (cm): 399.94
Distance (cm): 399.96
Distance (cm): 399.94
Distance (cm): 399.96
Distance (cm): 399.94
```