**Assignment -4**

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| Assignment Date | 25 October 2022 |
| Student Name | Mr. V. Maniyarasu |
| Student Roll Number | 713319IT024 |

# Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cm send “alert” to ibm cloud and display in device recent events.

# Code :

#include <WiFi.h> #include <PubSubClient.h> WiFiClient wifiClient; String data3;

#define ORG ""

#define DEVICE\_TYPE "Distance" #define DEVICE\_ID "Ultrasonic" #define TOKEN "WD6Mb(-d2F+X0xWqnB" #define speed 0.034

#define led 14

char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; char publishTopic[] = "iot-2/evt/event2/fmt/json";

char topic[] = "iot-2/cmd/home/fmt/String"; char authMethod[] = "use-token-auth";

char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE\_TYPE ":" DEVICE\_ID;

PubSubClient client(server, 1883, wifiClient);

const int trigpin=5; const int echopin=18; String command; String data="";

long duration; float dist;

void setup()

{

**Serial**.begin(115200); pinMode(led, OUTPUT); pinMode(trigpin, OUTPUT); pinMode(echopin, INPUT);

wifiConnect(); mqttConnect();

}

void loop() {

bool isNearby = dist < 100; digitalWrite(led, isNearby);

publishData(); delay(500);

if (!client.loop()) { mqttConnect();

}

}

void wifiConnect() {

**Serial**.print("Connecting to "); **Serial**.print("Wifi"); WiFi.begin("Wokwi-GUEST", "", 6);

while (WiFi.status() != WL\_CONNECTED) { delay(500);

**Serial**.print(".");

}

**Serial**.print("WiFi connected, IP address: ");

**Serial**.println(WiFi.localIP());

}

void mqttConnect() {

if (!client.connected()) {

**Serial**.print("Reconnecting MQTT client to "); **Serial**.println(server); while (!client.connect(clientId, authMethod, token)) {

**Serial**.print("."); delay(500);

}

initManagedDevice();

**Serial**.println();

}

}

void initManagedDevice() {

if (client.subscribe(topic)) {

// Serial.println(client.subscribe(topic));

**Serial**.println("IBM subscribe to cmd OK");

} else {

**Serial**.println("subscribe to cmd FAILED");

}

}

void publishData()

{

digitalWrite(trigpin,LOW); digitalWrite(trigpin,HIGH); delayMicroseconds(10); digitalWrite(trigpin,LOW); duration=pulseIn(echopin,HIGH); dist=duration\*speed/2; if(dist<100){

String payload = "{\"Alert!! Alert!! Distance\":"; payload += dist;

payload += "}";

**Serial**.print("\n"); **Serial**.print("Sending payload: "); **Serial**.println(payload);

if (client.publish(publishTopic, (char\*) payload.c\_str())) {

**Serial**.println("Publish OK");

}

}

if(dist>100){

String payload = "{\"Distance\":"; payload += dist;

payload += "}";

**Serial**.print("\n"); **Serial**.print("Sending payload: "); **Serial**.println(payload);

if(client.publish(publishTopic, (char\*) payload.c\_str())) {

**Serial**.println("Publish OK");

}else {

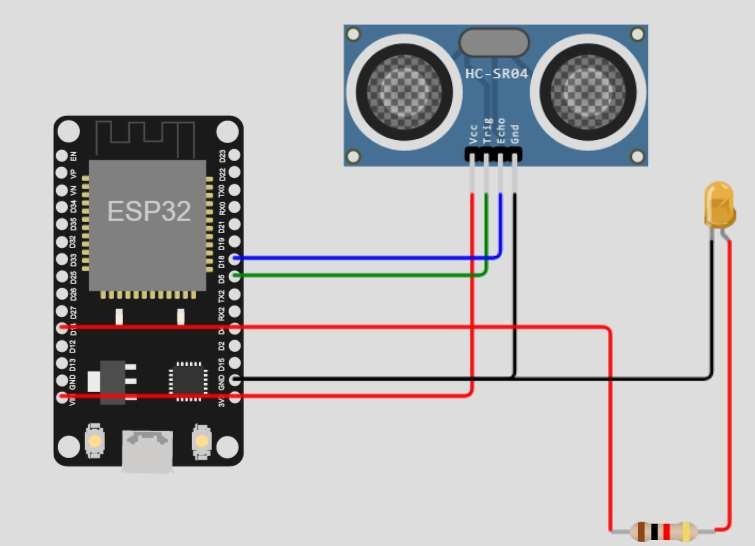
**Serial**.println("Publish FAILED");

}

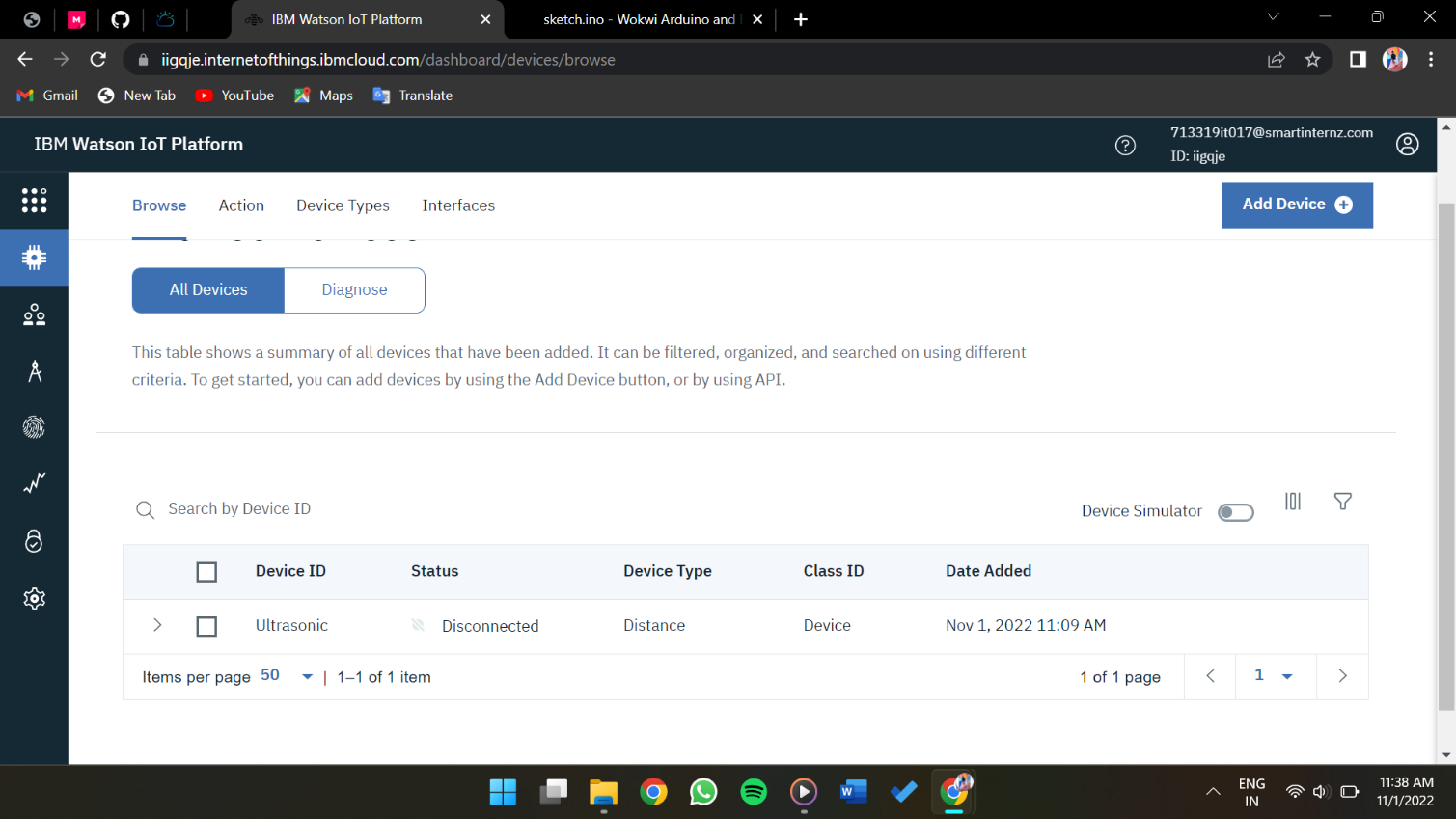
}

}

# Connections:

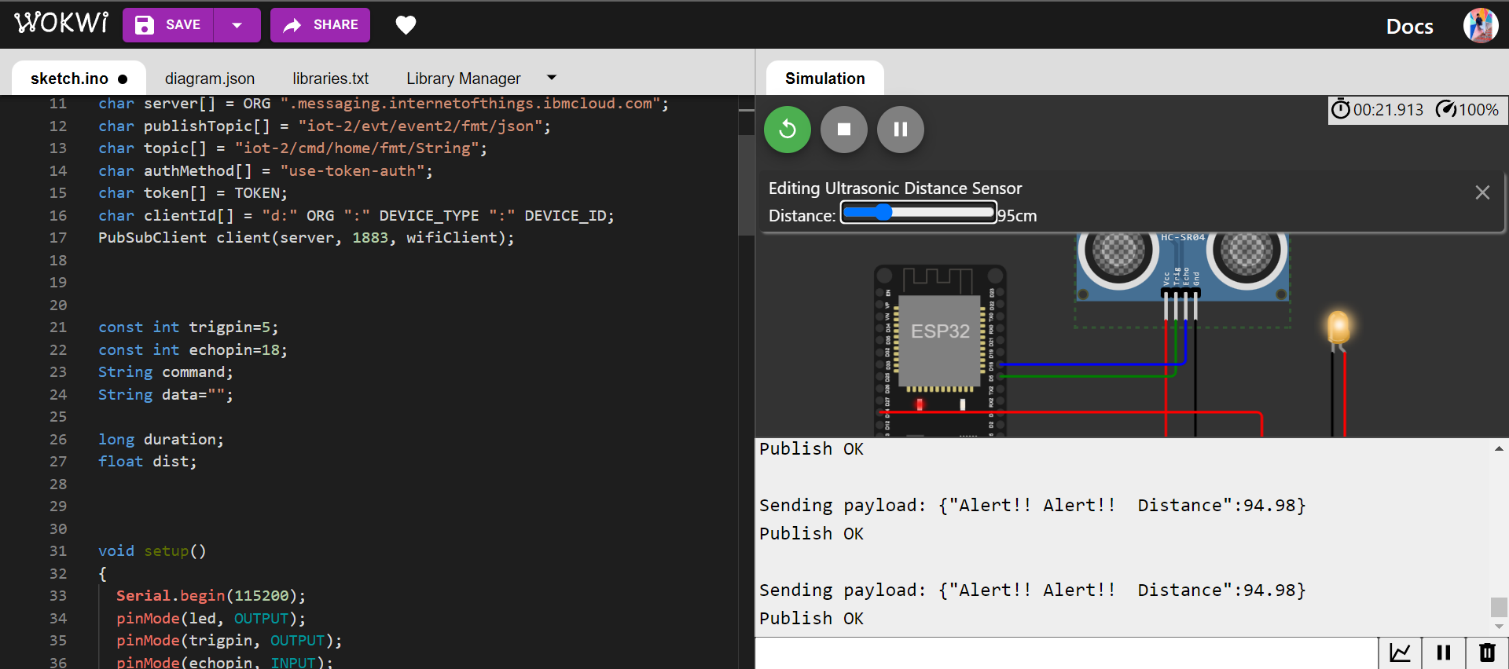


**WOKWI AND IBM CLOUD CONNECTED:**

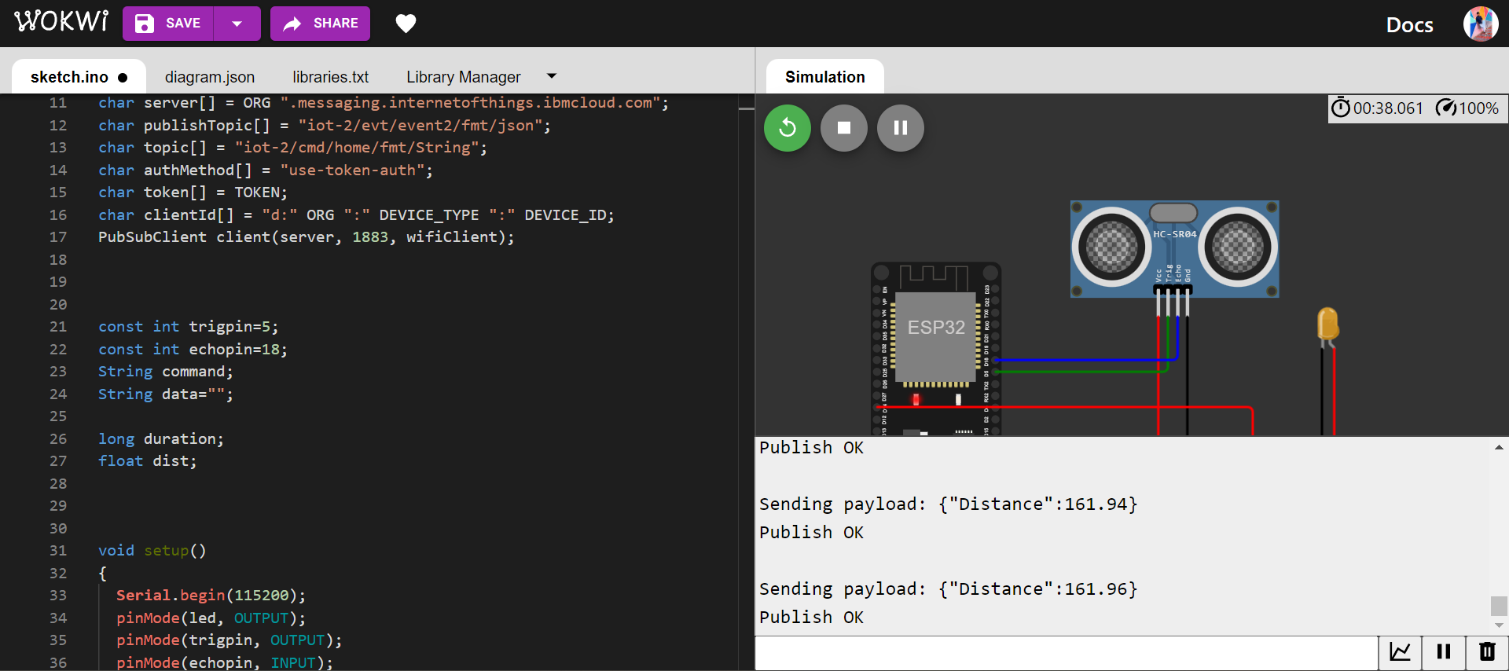
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**OUTPUT:**

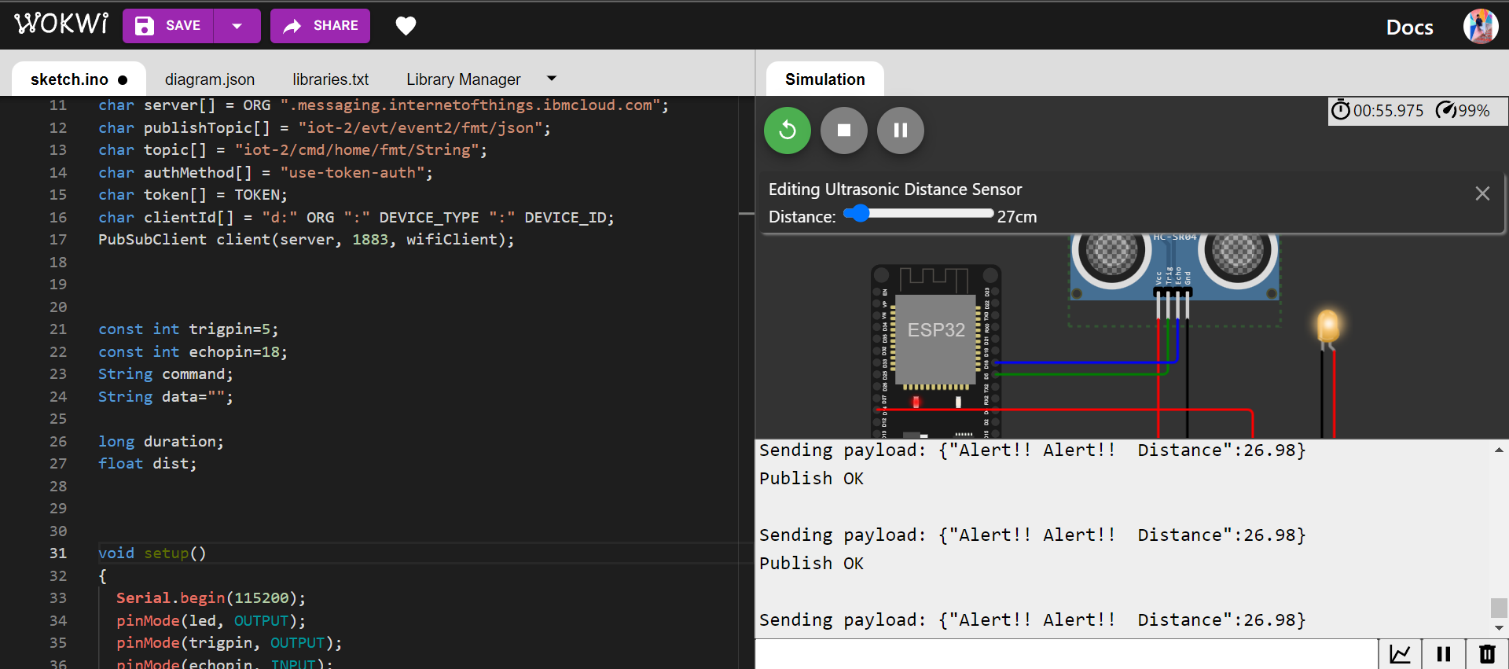
1. **Distance = 95 cm Status = Alert Message**

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1. **Distance = 162 cm Status = Normal**

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1. **Distance = 27 cm Status = Alert Message**

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**Reference link = https://wokwi.com/projects/347107058566300242**