**ASSIGNMENT-4**

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

**CODE**

#include <WiFi.h>

#include <PubSubClient.h>

void callback(char\* subscribetopic,byte\* payload, unsigned int payloadLength);

#define ORG "ouomac"

#define DEVICE\_TYPE "IOT"

#define DEVICE\_ID "4545"

#define TOKEN "20194545"

String data3;

char server[]= ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[]="iot-2/evt/distance/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);

#define ECHO\_PIN 2

#define TRIG\_PIN 4

#define led 5

void setup() {

// put your setup code here, to run once:

**Serial**.begin(115200);

pinMode(led, OUTPUT);

pinMode(TRIG\_PIN, OUTPUT);

pinMode(ECHO\_PIN, INPUT);

wificonnect();

mqttconnect();

}

float readDistanceCM() {

digitalWrite(TRIG\_PIN, LOW);

delayMicroseconds(2);

digitalWrite(TRIG\_PIN, HIGH);

delayMicroseconds(10);

digitalWrite(TRIG\_PIN, LOW);

int duration=random(1,200);

//Serial.println(duration);

//duration = pulseIn(ECHO\_PIN, HIGH);

return duration ;

//Serial.println(duration);

}

void loop() {

float distance = readDistanceCM();

//Serial.println(distance);

bool isNearby = distance < 100;

digitalWrite(led, isNearby);

**Serial**.print("Measured distance: ");

**Serial**.println(distance);

if(distance<100){

PublishData2(distance);}else{

PublishData1(distance);}

//PublishData(distance);

delay(1000);

if(!client.loop()){

mqttconnect();

}

//delay(2000)}

void PublishData1(float dist){

mqttconnect();

String payload= "{\"distance\":";

payload += dist;

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 PublishData2(float dist){

mqttconnect();

String payload= "{\"ALERT\":";

payload += dist;

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 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];

}

**Serial**.println("data:"+ data3);

if(data3=="lighton"){

**Serial**.println(data3);

digitalWrite(led,HIGH);

}else{

**Serial**.println(data3);

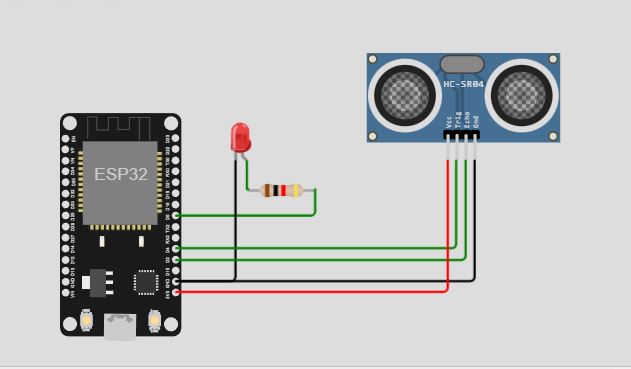
digitalWrite(led,LOW);

}

data3="";

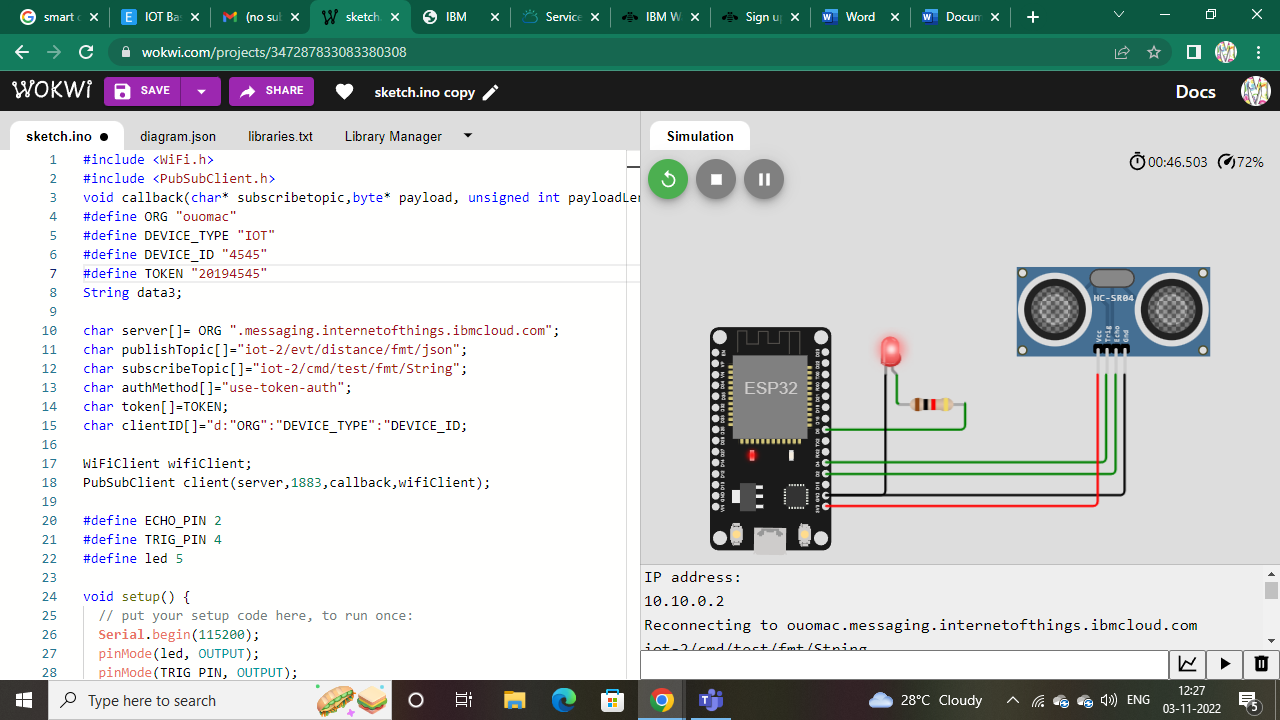
}

**CIRCUIT DIAGRAM:**

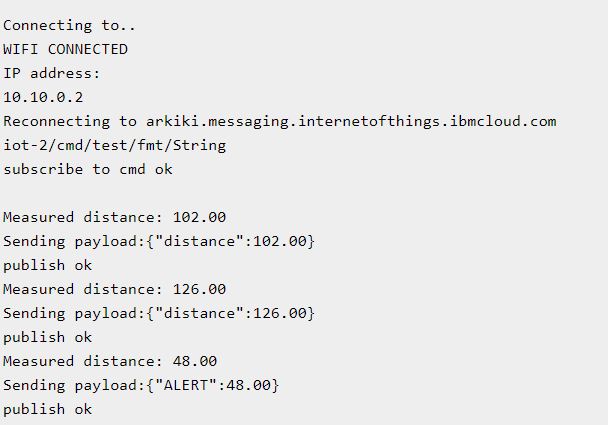


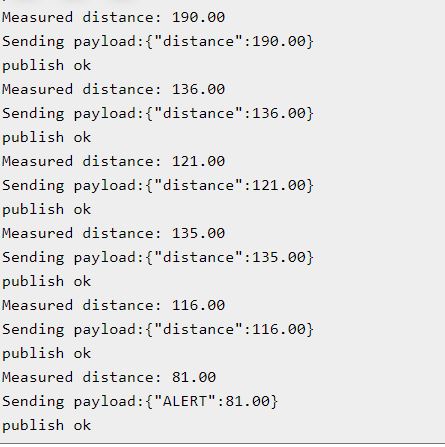
**Wokwi project link:**

[**https://wokwi.com/projects/347287833083380308**](https://wokwi.com/projects/347287833083380308)



**OUTPUT**





**Cloud storage:**

