ASSIGNMENT-4
DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	1 November 2022
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Maximum Marks	2 Marks

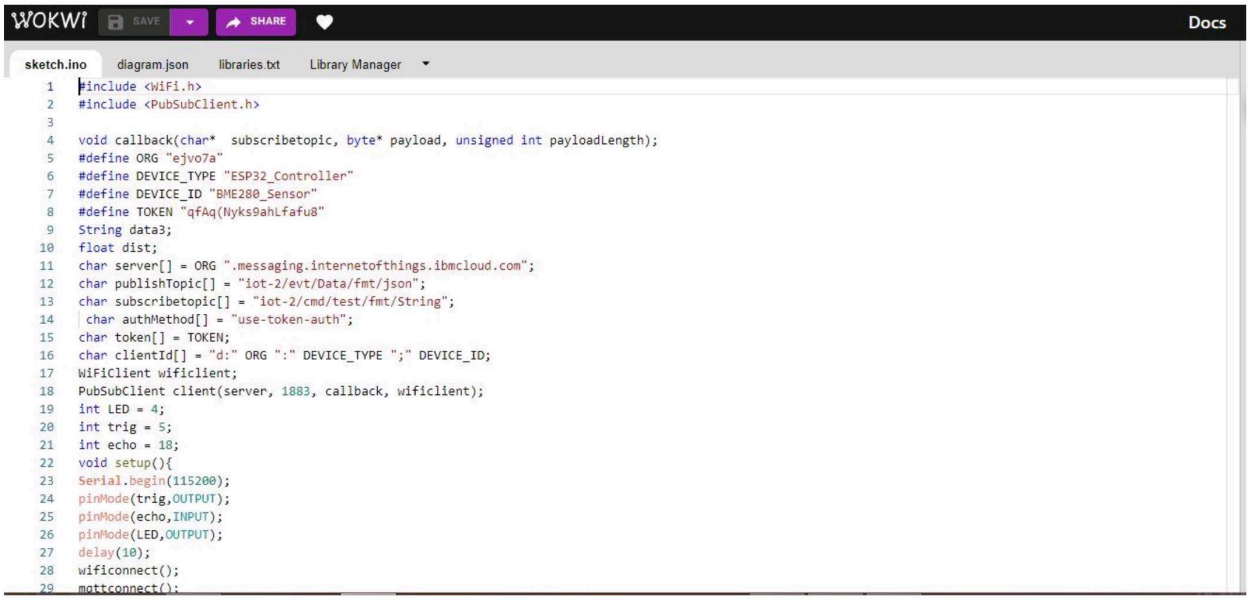
Question1 :

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

WOKWI LINK :

https://wokwi.com/projects/305566932847821378

CODE :



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```
wificonnect();
mqttconnect();
}
void loop(){
  digitalWrite(trig,LOW);
  digitalWrite(trig,HIGH);
  delayMicroseconds(10);
  digitalWrite(trig,LOW);
  float dur = pulseIn(echo,HIGH);
  float dist = (dur * 0.0343)/2;
  Serial.print ("Distancein cm");
  Serial.println(dist);
  PublishData(dist);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}
void PublishData(float dist) {
  mqttconnect();
  String object;
  if (dist <100)
  {
    digitalWrite(LED,HIGH);
    Serial.println("object is near");
    object = "Near";
    }
    else
    {
```

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```
    {
      digitalWrite(LED,LOW);
      Serial.println("no object found");
      object = "No";
      }
      String payload="{\"distance\":";
      payload + dist;
      payload += "," "\"object\":\"";
      payload += object;
      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();
```

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```
 }
 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++) {
```

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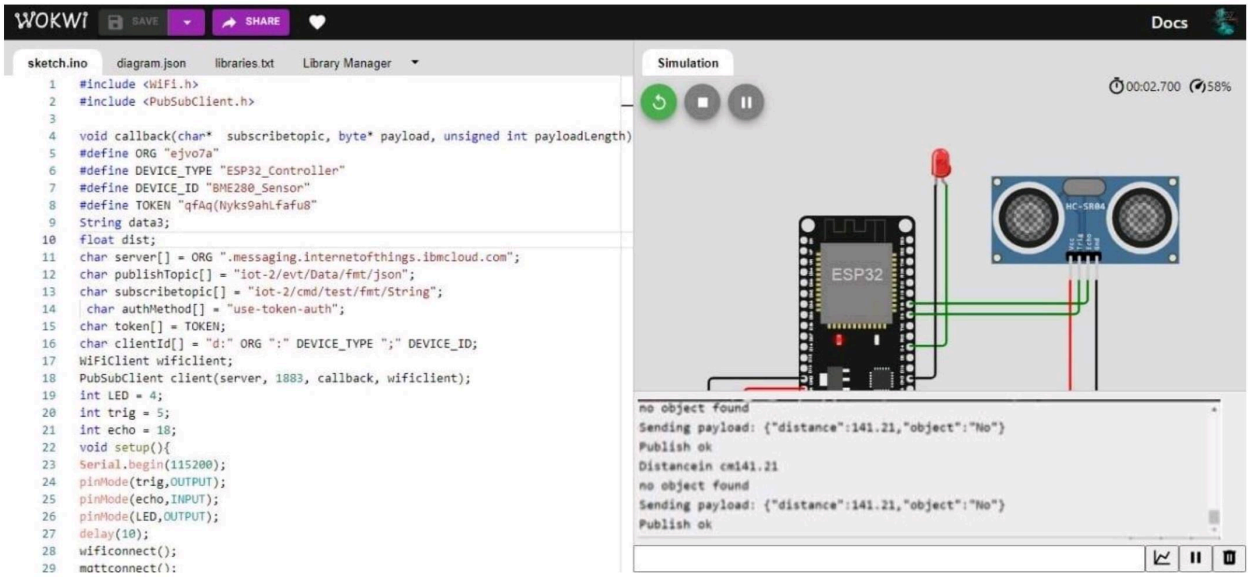
```
}
void initManagedDevice() {
  if (client.subscribe(subscribetopic)) {
    Serial.println((subscribetopic));
    Serial.println("subscribe to cmd OK");
    } else {
      Serial.println("subscribe to cmd FAILED");
    }
}
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)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

}
```

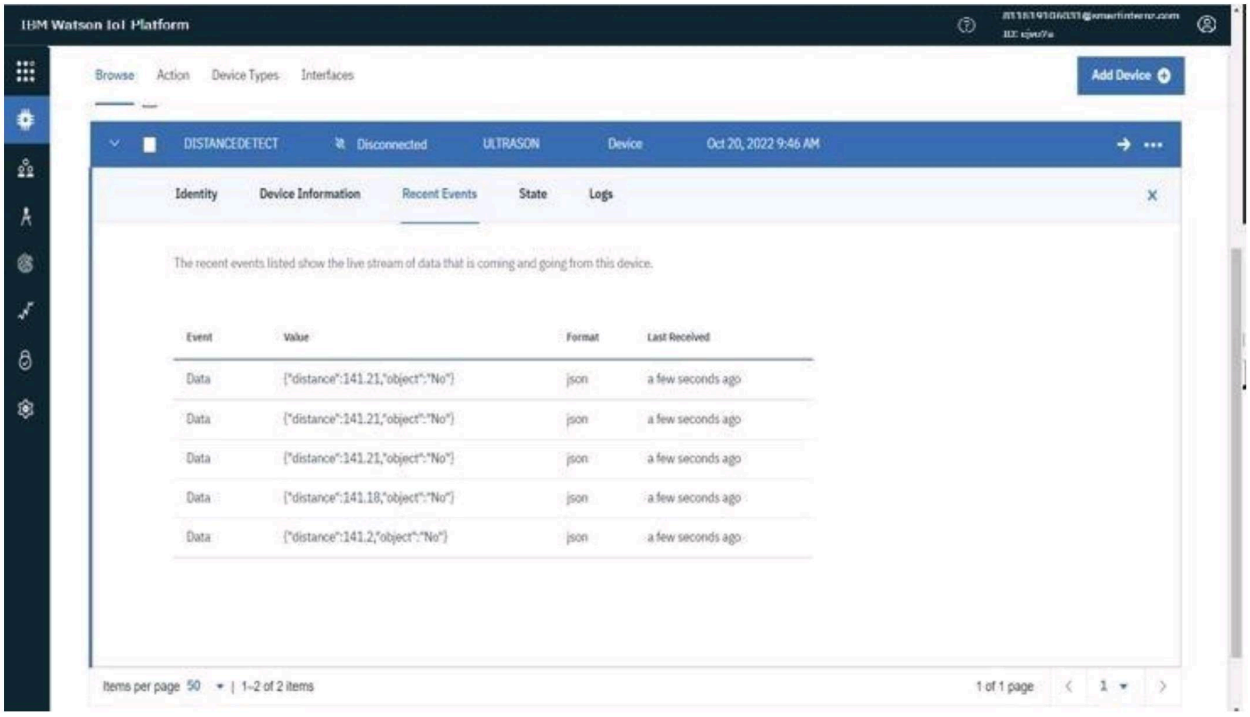
OUTPUT:



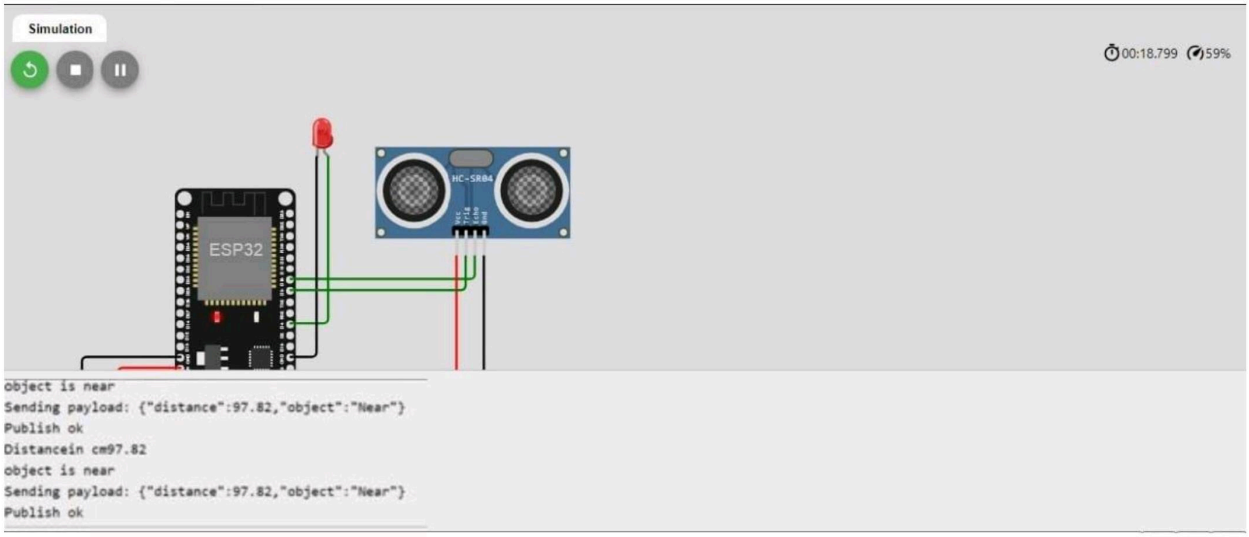

```
#include <WiFi.h>
#include <PubSubClient.h>

void callback(char*  subscribetopic, byte* payload, unsigned int payloadLength)
#define ORG "ejvo7a"
#define DEVICE_TYPE "ESP32_Controller"
#define DEVICE_ID "BME280_Sensor"
#define TOKEN "qfAq(Nyks9ahLfafu8"
String data3;
float dist;
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);
int LED = 4;
int trig = 5;
int echo = 18;
void setup(){
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED,OUTPUT);
delay(10);
wificonnect();
mqttconnect();
```

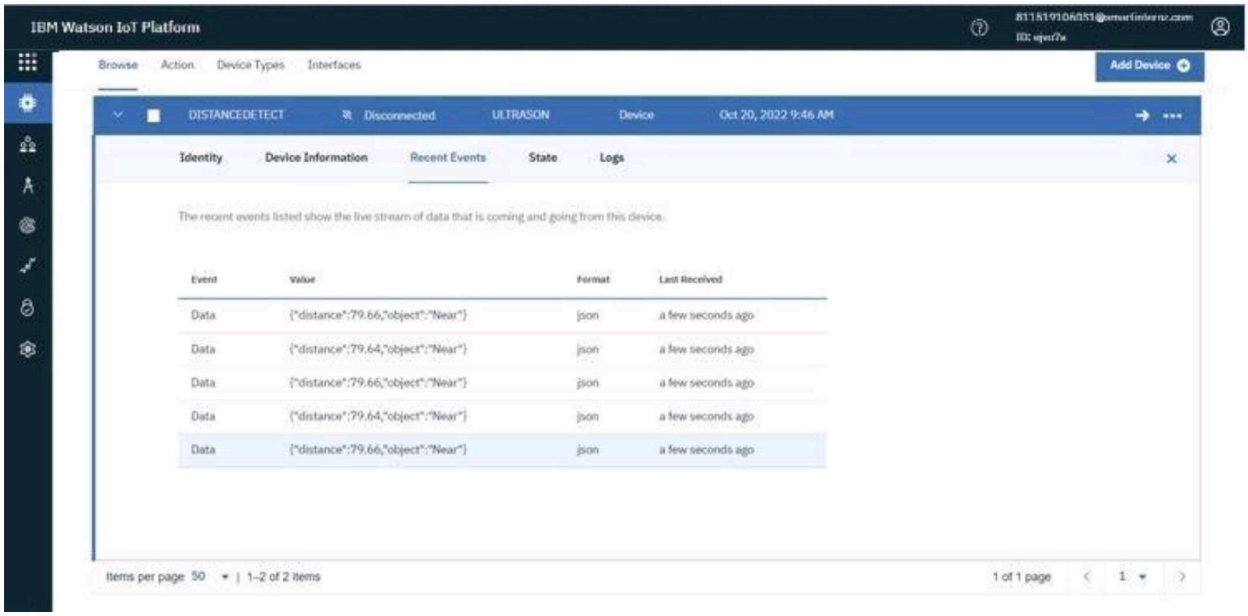
Data send to the IBM cloud device when the object is far



when object is near to the ultrasonic sensor



Data sent to the IBM Cloud Device when the object is near



https://wokwi.com/projects/347049153413513812