Assignment - 4 Distance Detection Using Ultra Sonic Sensor

Assignment Date	19 October 2022
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Maximum Marks	2 Marks

Question 1:

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/346228322074624596

CODE:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
#define ORG "f59trs"//IBM ORGANITION ID
#define DEVICE TYPE "ultrasonicsensor"//Device type mentioned in ibm watson
IOT Platform
#define DEVICE_ID "distancedetection"//Device ID mentioned in ibm watson IOT
#define TOKEN "AlGMGaaF01nawa1QA3" //Token
String data3;
float dist;
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of
event perform and format in which data to be send
char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd REPRESENT command
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
```

```
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the
predefined client id by passing parameter like server id, portand
wificredential
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();
void loop()// Recursive Function
 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();
/*.....retrieving to
void PublishData(float dist) {
 mqttconnect();//function call for connecting to ibm
    creating the String in in form JSon to update the data to ibm cloud
```

```
String object;
  if (dist <100)</pre>
    digitalWrite(LED, HIGH);
    Serial.println("object is near");
    object = "Near";
  else
    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");// if it sucessfully upload data on the cloud
failed
  } 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();
```

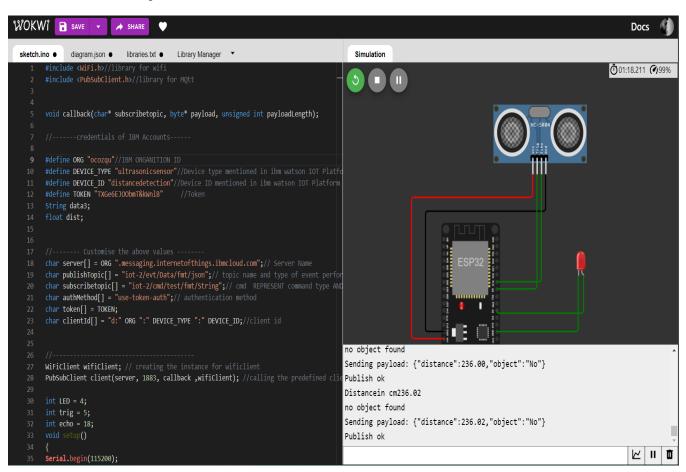
```
void wificonnect() //function defination for wificonnect
  Serial.println();
  Serial.print("Connecting to ");
 WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish
 while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  Serial.println("");
  Serial.println("WiFi 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++) {</pre>
   //Serial.print((char)payload[i]);
    data3 += (char)payload[i];
     if(data3=="Near")
// Serial.println(data3);
```

```
// digitalWrite(LED,LOW);

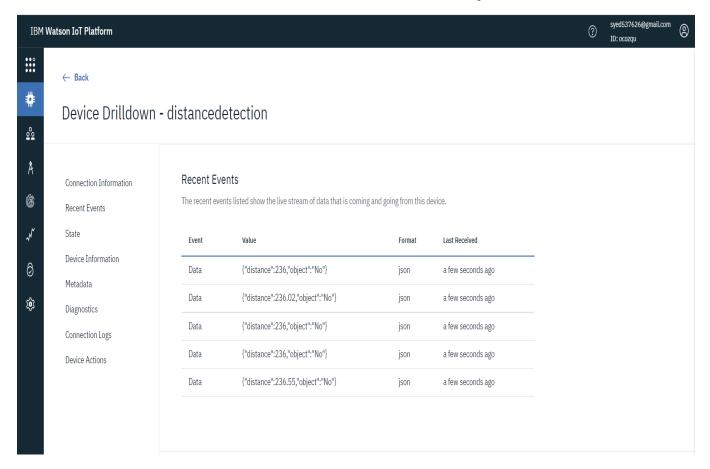
// }
data3="";
}
```

OUTPUT:

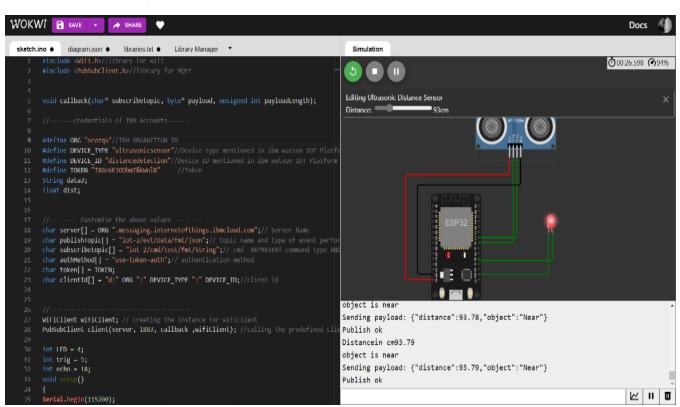
When the object is not near to ultrasonic sensor



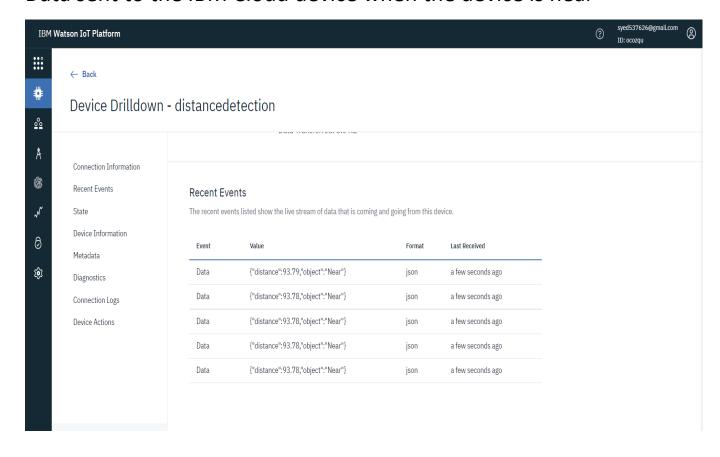
Data sent to the IBM Cloud device when the object is far



When the object is nearer to the ultrasonic sensor



Data sent to the IBM Cloud device when the device is near



https://wokwi.com/projects/346228322074624596