Assignment-4

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Problem Statement:

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.

Source Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
#define ORG "vkk3lh"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP-32"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "2019504030"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "9876543210"     //Token
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 12
#define TRIG_PIN 13
#define led 2
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);// Clear the trigger
  delayMicroseconds(2);
  digitalWrite(TRIG_PIN, HIGH);// Sets the trigger pin to HIGH state for 10
microseconds
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);
  int duration = pulseIn(ECHO_PIN, HIGH);
  //Serial.println(duration);
```

```
  //duration = pulseIn(ECHO_PIN, HIGH);
  return duration * 0.017;
  //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);
```

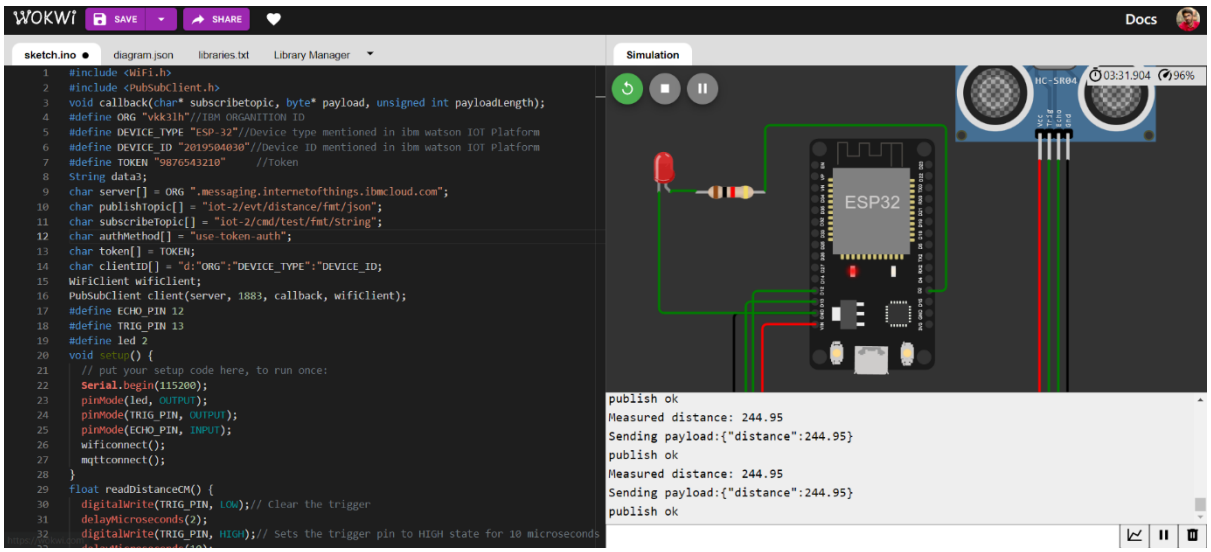
```
    }
    initManagedDevice();
    Serial.println();
  }
}
void wificonnect() {
  Serial.println();
  Serial.print("Connecting to");
  WiFi.begin("Wokwi-GUEST", "", 6);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.println("WIFI 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 = "";
}
```

Wokwi Link:

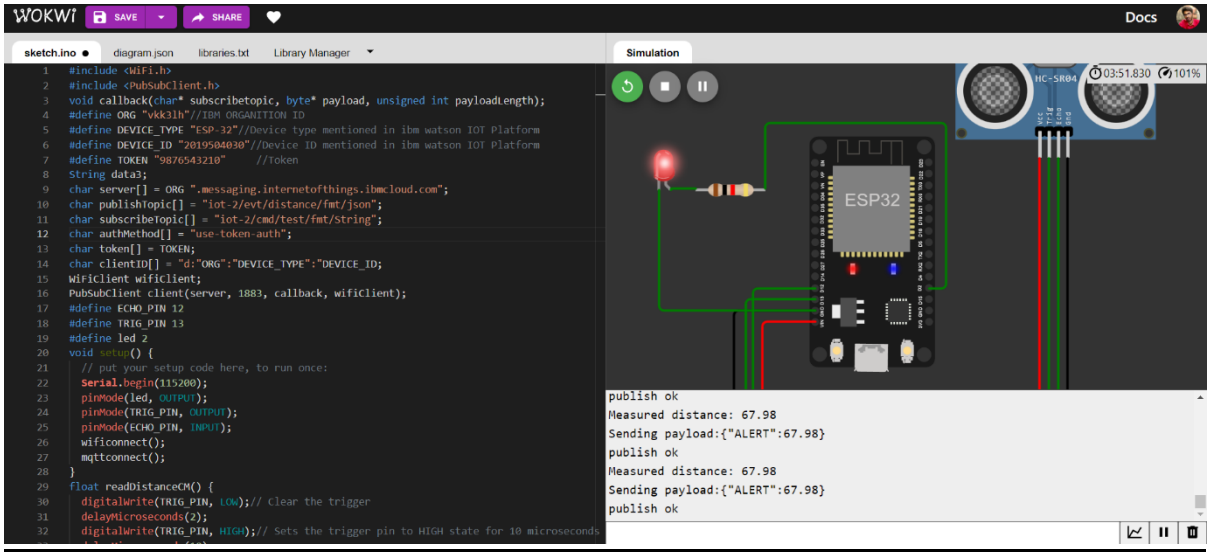
https://wokwi.com/projects/347143134975623762

Output:

Normal Case:



Alert Case:



IBM Cloud Storage: