Assignment-4

ESP32 Programming with IBM Cloud

Assignment Date	01 November 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 100cms send "alert" to ibm cloud and display in device recent events.

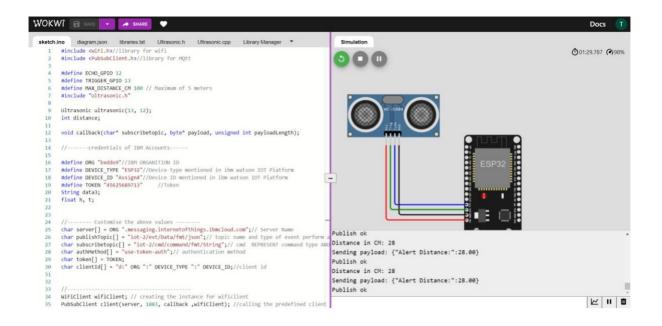
Upload document with wokwi share link and images of ibm cloud.

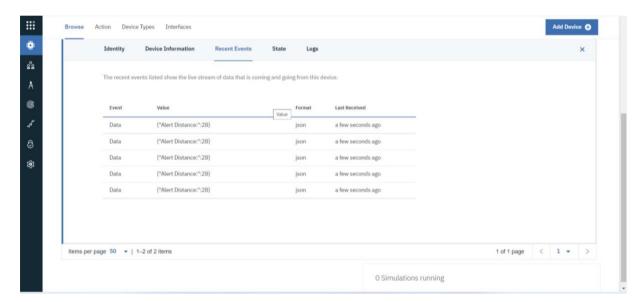
Solution:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#define ECHO GPIO 12
#define TRIGGER GPIO 13
#define MAX DISTANCE CM 100 // Maximum of 5 meters
#include "Ultrasonic.h"
Ultrasonic ultrasonic(13, 12);
int distance;
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
//----credentials of IBM Accounts-----
#define ORG "8zenx2"//IBM ORGANITION ID
#define DEVICE_TYPE "raspberrypi"//Device type mentioned in ibm watson IOT
Platform#define DEVICE_ID "dhaya29"//Device ID mentioned in ibm watson IOT
Platform #define TOKEN "Dhaya@29" //Token
String data3;
float h, t;
//----- Customise the above values ------
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/command/fmt/String";// cmd REPRESENT command type AND
COMMAND IS TEST OF FORMAT STRING
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
void setup()// configureing the ESP32
```

```
Serial.begin(115200);
 delay(10);
 Serial.println();
 wificonnect();
 mqttconnect();
void loop()// Recursive Function
 distance = ultrasonic.read(CM);
 if(distance < 100){</pre>
 Serial.print("Distance in CM: ");
 Serial.println(distance);
 PublishData(distance);
 delay(1000);
 if (!client.loop()) {
   mqttconnect();
 }
 delay(1000);
}
/*.....*/
void PublishData(float temp) {
 mqttconnect();//function call for connecting to ibm
 /*
    creating the String in in form JSon to update the data to ibm cloud
 String payload = "{\"Alert Distance:\":";
 payload += temp;
 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 then it will
print publish ok in Serial monitor or else it will print publish 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 the connection
 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];
 Serial.println("data: "+ data3);
 if(data3=="lighton")
 {
Serial.println(data3);
 }
 else
 {
Serial.println(data3);
 }
data3="";
}
```





Wokwi share link:

https://wokwi.com/projects/346461295197815380