Assignment-4

ESP32 Programming with IBM Cloud

Assignment Date	26 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 100cms send "alert" to ibm cloud and display in device recent events.

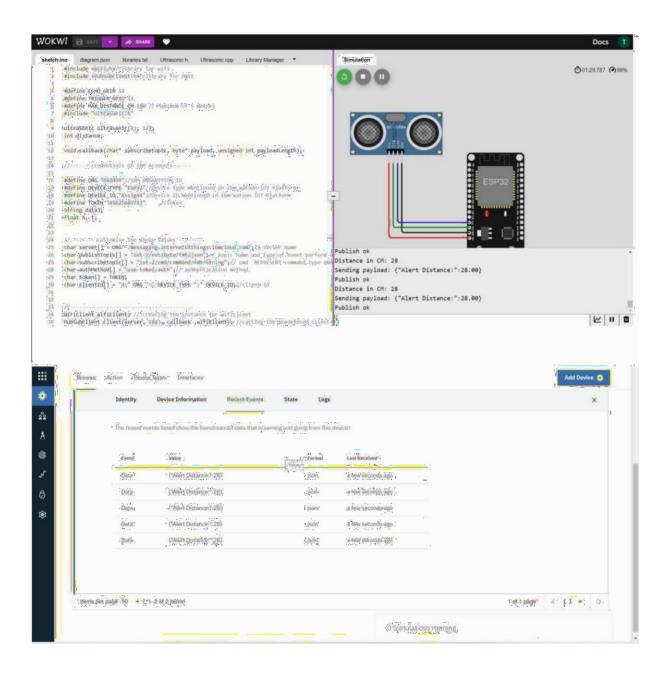
Upload document with wokwi share link and images of ibm cloud.

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 "2melo1"//IBM ORGANITION ID
#define DEVICE_TYPE "Kruthika"//Device type mentioned in ibm Watson IOT
Platform
#define DEVICE ID "0405"//Device ID mentioned in ibm watson IOT
Platform #define TOKEN "12345678" //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
Serial.print("Distance in CM: ");
Serial.println(distance);
PublishData(distance);
delay(1000); if
(!client.loop()) {
      mqttconnect();
  }
  }
  delay(1000);
}
/*....retrieving to Cloud ......*/
       PublishData(float temp) {
void
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");
  }
}
      mqttconnect() { if
void
(!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());
}
       initManagedDevice() { if
void
(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/347287669596750420