Assignment -4

ESP32 Programming with IBM Cloud

Assignment Date	3 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.

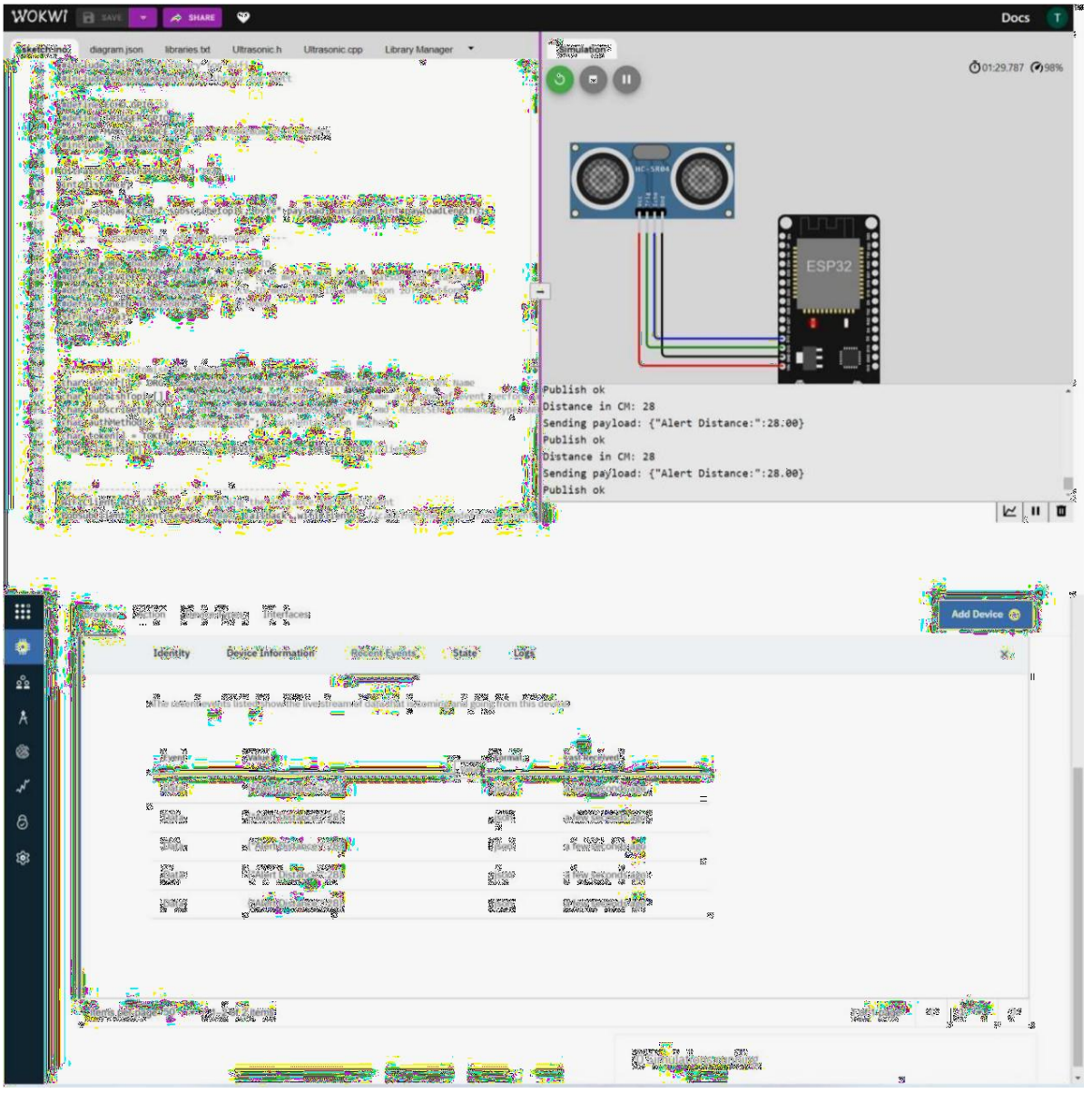
Upload document with wokwi share link and images of ibm cloud.

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 "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
< 100){
 Serial.print("Distance in CM: ");
 Serial.println(distance);
PublishData(distance);
delay(1000); if
(!client.loop()) {
       mqttconnect();
  }

  }

  delay(1000);



}

/*.....retrieving  to  Cloud ..... */

 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++) {
      //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
SAVE
SHARE
Docs
diagram.json
libraries.txt
Ultrasonic.h
Ultrasonic.cpp
Library Manager
Simulation
01:29.787
98%
HC-SR04
ESP32
Publish ok
Distance in CM: 28
Sending payload: {"Alert Distance:":28.00}
Publish ok
Distance in CM: 28
Sending payload: {"Alert Distance:":28.00}
Publish ok
Add Device
Identity
Device Information
Recent Events
State
Logs